



COAL AGE



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Convincing the Boss

A WELL-KNOWN American power engineer has succeeded in his profession because of his ability to quickly convince his superiors that he is right. He finds that the best way to convince is to talk in terms of the almighty dollar. When he says to

the owner, "You are actually burning up every day in those furnaces a ten-dollar bill that could as well be saved," the owner feels in his pocket for the escaped ten-spot. The engineer soon gets the stokers he wants.

He wants to increase the size of the plant and thereby advance his salary, so he says to the owner, "I'll work for you for nothing next year if you will give me your exhaust steam." The owner's interest is again aroused, the exhaust steam is made to do good work, and the owner saves MORE than the engineer's salary.

"It's strange, isn't it," he remarked one day as the owner was on an excursion through the plant, "that our oil costs



Money Talks

more after we have used it than it costs to buy it." The owner was stumped. He had never heard of such a thing, so he asked for an explanation. The engineer did himself proud in explaining the nuisance of oil in boilers. The filter he wanted

was therefore quickly installed.

He always attacks his needs in an original way. He takes the owner by surprise whenever he can, so as to get due consideration. When he wanted a feed-water heater he said, "I need another helper. Can I have one? He won't cost anything." This opened the way to his carefully planned argument. The feed-water heater was installed.

Owners, managers, superintendents and bosses are all human beings and they enjoy a change in method of attack. Don't hammer away for what you want in the same way all the time.

Money talks, so why not give it a chance to be heard?

Correct Tipple Design--I

BY M. L. HYDE*

SYNOPSIS—This is the first of two articles on this subject. It sets forth what a tipple should be and what it must be able to do in order to fulfill to the highest degree the function for which it was built.

Between satisfied custom and efficient mining comes the correctly designed tipple as a connecting link, meeting the demands of each. Such a tipple must satisfy the desire of the sales department for proper grading combined with proper loading and careful cleaning—and of the operating department for moderate first cost combined with economical operation.

No matter how high the coal in quality, no matter how well mined, unless the demands of the consumer are complied with, failure results.

The elasticity of a tipple, in order to grade and mix various sizes, must therefore be unlimited. Its ability to load anything the railroad supplies, from a "battleship" to an automobile box car, must also be unlimited; and this loading must be accomplished with a minimum amount of resultant slack. The equipment for picking must be complete in every particular, even though at the time of building there is every indication that the coal to be handled will reach the tipple clean. It is false economy to omit machinery for performing this work, as a clean seam today may be a dirty one tomorrow.

If one stops to think of the strides made in automatic stokers, heaters, furnaces, gas producers, ranges, etc., during the past few years, he will readily appreciate the necessity for unlimited elasticity in every department of the tipple if he wishes to keep pace with the consumer's ingenuity in thinking up new requirements to be met. The tipple, to conquer these problems for the next 30 or 40 years, must indeed be almost human, and a shorter life is not commensurate with the investment.

Among the general features essential to a tipple are the ability to make as many grades, and any mixture thereof, as the market to be catered to may call for; to handle each of these grades over the shortest distances possible without drop or change in direction; to handle first the lump, then the egg, then the nut, etc., each in proportion to its market value, over the gentlest course, allowing for lip screening of the large grades and for mechanical loading where the capacity required is such as to necessitate it; to allow of cracking the lump to any given smaller size, with a minimum loss in fines (this being a condition coming more and more to the front owing to the antagonism of the buyer to large lumps, which is only reasonable, and therefore it is safe to predict that the near future will see lump a drug on the market, with a heavy demand for a 6- or 7-in. cobble); to handle rock from the mine car without allowing it to come in contact with any of the coal handling machinery; to handle local coal without the expense of cleaning; to furnish slack, or nut and slack, to the boiler-room; to furnish any combination of grades for

locomotive coaling purposes, rescreening, washing, for coke ovens or for auxiliary outside storage to be held for boiler or local purposes in case of a shutdown; to allow of removing waste from the tables, spilled coal about the cars and dirt shoveled from them with the least possible cost and the least complication of equipment; to allow of spotting and loading cars regardless of weather or other conditions. The tipple should, furthermore, have a mechanical equipment low in power consumption and so constructed that repairs and replacements can be made by the local force. Finally it should be moderate in first cost and low in operation and upkeep expense.

We will first take the details of all equipment making up the complete unit, the reasons for their being given preference, and then describe a tipple embodying them.

GOOD TYPE OF HEADFRAME

About four years ago the Allen & Garcia Co., of Chicago, put on the market a patented headframe having two main columns placed in the middle of the shaft curbing and at either end just back of the guides, these members being carried by brackets from the columns. The center guides were carried by a central column hung from the main structure so as not to rest on the shaft timbers.

When adapted to an end hoist tower the sheaves are carried directly on an A-frame of the same width as the columns, the forward leg of which is carried down to the ground outside of a resultant of the cable stress. This construction affords a rigid tower, easily erected and maintained, and costing but little more than half as much as the standard six-leg frame. It should be furnished complete with landing dogs at the surface, gates at all landings, ropes and their fittings, and three sheaves (an extra one being carried in case of emergency). Arrangements should also be made for replacing without serious inconvenience a broken sheave and for taking off the ropes and replacing them when such renewal is necessary.

Mines having a capacity not exceeding 600 tons, where the topman also acts as lampman, can handle the men to and from the mine to best advantage by having the landing stage for men at the same elevation as the topman's office in the tipple. With this arrangement the topman gives out all lamps at the lamp house and then goes to his office and handles the signals for lowering the men. Each miner, before getting on the cage, hangs his check on the check-board placed on the side of the topman's office.

On leaving the cage at the end of the shift he removes his check and hooks it on the lamp, the numbers of both corresponding; he then returns the lamp to the lamp house. If he fails to hook his check on his lamp he cannot get the lamp in the morning. This forces him to remove his check from the board, which affords an accurate record of the men in the mine at any time.

The car tally-board is also located in the topman's house, so that each loader can ascertain at the end of the shift just what his credits for the day are. The topman does not have to leave his office except to send

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down supplies, and no one can get in the mine without his permission.

Mines having a capacity of more than 600 tons and using a separate lampman and surface cager can lower the men from the ground level to better advantage than from the upper landing, though the same tally system is recommended.

MAIN STRUCTURE

There is no excuse for a tipple not having clean-cut, uniform lines. It should be in harmony with the rest of the plant units, pleasing to the eye and an ornament to the plant as a whole. A tipple covered with bumps and humps, two or three stories high, is no credit to either designer or owner and since it is the highest structure about the mine, its abnormality ruins all possibility of harmony and beauty in the general layout. Moreover, all these bumps cost money.

A low building, with easy stream-line design, costs less, looks better, is easier repainted, re-sided, reroofed and protected from fire than any other type; and having a

room should be partitioned off from the rest of the building, and should be free of windows. There is no way to keep the picker boys from skylarking when the cat's away, which often results in broken windows or a boy being hurt. If they are shut off from all machinery the latter cannot easily happen.

With the building designed along the lines suggested, roof trusses, kneebraces and latticed members of all sorts are unnecessary. There is no place for coal dust to accumulate, and the roof presents a smooth inner surface, which a coat of whitewash applied now and then keeps clean, light and cheerful.

Both speaking tubes and electric bells should connect the picking room to the topman's office. Telephones and pneumatic signals should connect the topman's office with the surface landing, mine, mine manager's office and hoist engine room. This office should have a desk on which to make out car sheets, records, etc.

Below the tipple, at the ground level, the tipple foreman should have an office with a desk, where bills of lading can be filled in and tipple time books, car seals,

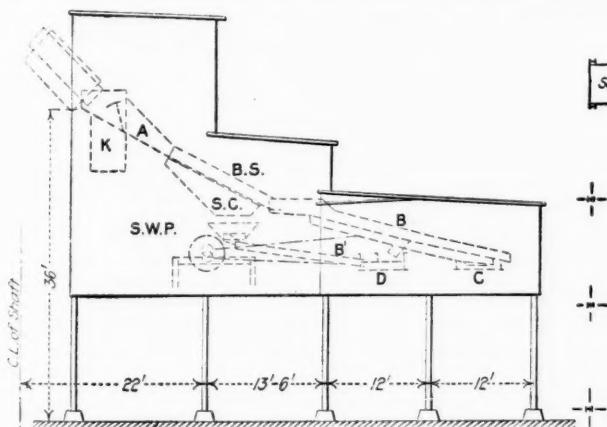


FIG. 1. AN ARRANGEMENT ALLOWING GENTLE HANDLING OF LUMP

low center of gravity, the live loads from screens, etc., are easy on both structure and foundations.

All-steel construction is recommended, with columns of 8-in. H-sections and flooring of standard 10-in. I-beams covered with $\frac{1}{4}$ -in. checkered plates. The roof should be of Hy-rib and concrete plaster 2 in. thick, set on 4-in. I-beams and whitewashed on the under side for light. Siding should be of 20-gage American ingot corrugated iron, or its equal. The whole structure should be painted with two coats of graphite, with a slate-gray body and black trimming. Foundations should set 24 in. above the ground, the latter being carefully leveled and ditched.

Wire-ribbed glass skylights should bear direct on every machine, and the picking-room roof should be so fitted for its entire length.

Heating coils must be furnished for the topman's office and the picking room. The latter room should be arranged with sliding shutters in the side walls for ventilation during hot weather. The entire structure should be well lighted with electricity, especially between the tracks and in the picking room, where the lamps should be mounted in an inverted white enameled trough set 36 in. over the tables, with lamps on 4-ft. centers.

Trap doors should be placed in the floor of the picking room to permit the removal of sweepings. This

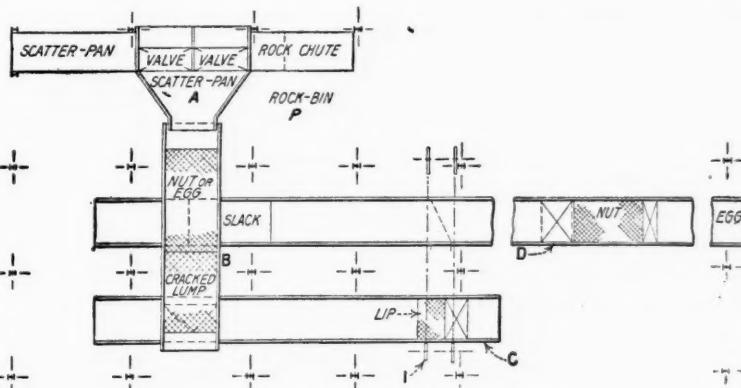


FIG. 2. GENERAL PLAN OF A TIPPLE, ILLUSTRATING CLEARANCES

etc., kept. Located here should be locked tool-boxes, containing the tools necessary for making ordinary repairs, as well as car pinchers, shovels for cleaning up and other equipment required in the day's work, all marked with the department number of the tipple.

WASTE BINS SHOULD BE UNDER THE FLOOR

Waste bins for intermediate storage of refuse from picking tables should set directly under the floor of the picking room. This obviates the installation of conveying machinery to handle gritty substances. These bins are the only ones recommended to be put under the tipple; all others should be well removed from it. Waste from the tables is not subject to spontaneous combustion and therefore not dangerous; nor do the bins required to hold it increase the height of the structure; whereas if the screens were set over small coal bins, not only would the element of danger be introduced, but the tipple height would necessarily be increased, with the extra drop to all the better grades that must pass over the bins on their way to the cars.

It will be found cheaper and more satisfactory to locate all storage bins away from the tipple. These bins should be cylindrical, with conical bottoms and lined throughout with cement, if the maximum tonnage with maximum safety and cleanliness is to be obtained for the smallest first cost.

The tipple building should be so designed that neither wagons nor carts will ever have to go under it. These cut up the ground and as a result of spillage are dirty. Furthermore, underneath a tipple is no place for a horse.

As part of the complete tipple a 50-ton empty track scale and a 125-ton loaded track scale for railway cars should be included, also a platform located at the empty scale for storing coal doors for box-cars. These, or the materials for making them, are usually furnished by the railroads in car lots, and it saves much time if a platform is furnished upon which they may be conveniently stored.

COAL-HANDLING EQUIPMENT IN DETAIL

Self-dumping cages with rollers at top of dumping platform are recommended. With this design greater leverage, and consequently a reduced stress on both cage and headframe, are secured. The cages should be designed to allow the car to project beyond the ends of the cage, so that in the dumped position the car would be lifted a minimum distance above the receiving hopper, insuring no drop and no spilling of the car's contents down the shaft.

The guide irons should be so curved that during the dumping period the car is rapidly dropped to the emptying position and while discharging is moved slowly. Horns are preferable to drop-rails for holding cars on the cage. Double bridle chains should be used on every cage in which it is intended to handle men.

There are many advocates of the platform cage with automatic pushers for removing cars therefrom, after which they go to a rotary or cross-over dump. The first cost, as well as the operating expense of a tipple so designed, far exceeds that of one with a self-dumping cage. Its capacity is less, and even with rotary dumps there is absolutely no saving in breakage over a properly designed self-dumping equipment. Some mines produce a dusty coal, and cars fitted with end doors are objected to on account of leakage along haulage roads. An all-steel car can easily be built with end door to obviate this difficulty, and the first cost is but a few dollars higher than that of the solid-box car.

RECEIVING HOPPER

The receiving hopper, often called the scatter pan, especially in tipples using bar screens, should be built with $\frac{1}{4}$ -in. steel sides and $\frac{5}{16}$ -in. steel bottom plates, with an angle of 28 deg. along the bottom. It should have sides extending straight for a distance sufficient to allow of placing hinged valves in its bottom, through which rock or local coal can be diverted without going over the tipple machinery proper. These valves should be counterweighted and operated by levers in the topman's office. From the valve the hopper sides should converge to a discharge opening approximately 5 ft. wide. It is not good practice to make this a storage hopper; in fact it should be as short as possible, being the only place in the tipple where the coal is allowed to flow by gravity, and consequently with some slight damage. The hopper bottom should ease off to a level discharge before the coal leaves it, thereby retarding the flow decidedly.

From the receiving hopper the coal should pass either to a bar screen (if the screened lump basis is in force),

to a weigh pan direct, or to a preliminary shaker, if a run-of-mine basis is employed, the car being weighed in the latter case on platform scales before dumping.

Weigh pans for lump or run-of-mine coal are objectionable. Throwing the entire contents of the mine car into the pan in a mass, and then dropping it out again in a mass, results in unreasonable breakage. Considerable extra height is required for the tipple, and all in all the practice has little to recommend it.

Fig. 1 shows an efficient way of overcoming this vicious handling of the lump when the coal is friable, though requiring a little more office work. The coal passes from the receiving hopper to the bar screen *BS*, the lump going direct to the shaker *B*, and the fines falling to the chute *SC*, thence to the weigh pan *SWP*, where it is weighed and discharged to the screen *B*.

It is assumed that with this system steel mine cars of uniform weight are used. These are weighed loaded, on platform scales set to balance the empty car, thus recording the net weight of the car's contents, from which at the end of the day the weight of the slack is subtracted, leaving the weight of lump for which each loader is to be credited.

This gives an accurate record of every pound of coal leaving the mine and allows of the easiest possible handling of the lump and egg. It requires an extra weighman and extra work in the office, which is more than counterbalanced by the saving in lump and the correctness of the records. With a hard coal this would prove an unnecessary refinement.

Bar screens are always of a standard adopted by the locality in which they are used.

WEIGH PAN SHOULD BE SUBSTANTIAL

The weigh pan should be of substantial design, with $\frac{1}{4}$ -in. sides and $\frac{5}{16}$ -in. bottom, and should be suspended from the tipple scales (which should be of at least six times the capacity of the work for which they are required), equipped with quick reading dial. The pan should receive the mass of coal and bring it to a standstill as quickly, yet as easily, as possible, and should discharge it in the same way.

On being discharged from the receiving hopper or weigh pan, a preliminary shaker is recommended. This serves the purpose of feeder to the picking tables and of a coarse separator as well. It handles the coal gently and without drop, makes a thorough separation of the lump from the smaller sizes and is low in first cost.

For capacities up to 1,500 tons per day a screen 6 ft. wide is ample, and for capacities up to 3,000 tons an 8-ft. screen is sufficient. If the egg, nut and slack are sent to one table, three 3-ft. sections of egg perforations will be required, and four sections of nut perforations if the nut and slack go to one table. This should be the extreme length of screen plate installed, additional capacity being gained through additional width. This is because of needless attrition when the coal is jiggled over an unnecessary length of perforated plates. With the length of perforations suggested nothing will be gained by introducing a feeder before the screen.

One-quarter-inch side plates and $\frac{5}{16}$ -in. bottom plates should be used in the screen construction. Perforated plates should be bolted on with lock-washer bolts, and extra plates of different sized perforations should be carried in stock on the tipple floor ready for use.

The path of the coal over this screen should be as follows: The egg, nut and slack falling through to the lower deck pass direct to the small-coal picking table. The lump going over the egg screen reaches the 6- or 7-in. cobble perforations, the undersize going to the lump table and the oversize, or large lumps, going to a cracker. In case it is desired to load lump direct, the cobble screen plate is removed and this coal all sent to the lump table.

This screen is driven through connecting rods from an eccentric shaft carried on an independent steel framework, the shaft in turn being driven by belting from a 20-hp. motor. The screen should be suspended by four hanger rods, should set at an angle of 14 deg. for the egg screen and 12 deg. for the cobble screen. A speed of 90 r.p.m. will give best results, and no trouble need be feared from undue vibration.

TRAVELING PICKING TABLES

Manufacturers mostly recommend conveyors of either the apron or drag type, preferably the former, claiming less attrition and a more uniform spread to the ribbon of coal on the table. Neither of these advantages shows up well enough in actual practice to warrant its consideration in preference to the horizontal shaking type of table used for the past decade in Great Britain in many of the best-designed tipplers which it has been the writer's pleasure to study.

The apron conveyor consists of two strands of roller chain, carrying plates or trays of steel from 3 to 5 ft. wide between them. They can only be used as picking tables when carrying material on the top strand. They are excessively heavy in weight and high in first cost. Expensive structures are required for their support because of the weight and height necessary. The chains require continual oiling from one end of the conveyor to the other, as well as all machinery at both head and foot.

Fine wet coal causes considerable trouble on this type of conveyor, particularly in cold weather, as it gets between the overlapping edges of the plates and freezes them together during the night shutdown, putting a tremendous stress, often accompanied with serious results, on the whole mechanism when starting up in the morning. The only remedy for this is the placing of steam coils under the whole length of the carrying strand, in which steam must be carried night and day during a cold spell.

With dry, fine coal the apron is dirty, for fines leak between the plates and fall to the bottom strand, where they are rolled around until a sufficient accumulation warrants shoveling them away. Owing to the chains being on the outside edges of the carrying plates, guards are required over them to protect the arms of the pickers. These guards take up about 12 in., and force the boys to stand that much farther from the coal to be handled, making a decidedly uncomfortable reach to the center of a 5-ft. table, often to the neglect of dirty coal traveling there.

Most serious of all drawbacks to this table is its inelasticity when mixing two or more sizes. Where this is done the mixture should always be made by taking the already picked grades from their given tables and transferring them to the table carrying the largest size of the desired mixture. If this method is pursued all

coal flows in one direction, over one chute to the car to be loaded. It reaches the car nicely mixed and fully lip-screened. This method also allows of the most gentle discharge. Where the different tables discharge their various grades to gathering chutes leading to a common car-loading chute, all these advantages are sacrificed.

As the apron has but one point of discharge, namely, its head, all grades must be carried to that end and there delivered to gathering chutes. This can be accomplished with open cars, but not with both open and box-cars. The mixture is made directly over the car at a point where it is hard to dispose of lip-screenings. The mixing chutes must necessarily be long, and those for the small grades steep, increasing the height and cost of the entire structure, as well as introducing breakage at the critical point.

33

The Indiana Situation

A number of new coal-mining companies are projected for operation this fall and winter in Indiana, but owing to the unsatisfactory state of trade, plans for their consummation are not progressing as rapidly as was expected. Those interested in these new ventures are now giving much thought to the future outlook.

Former State Mine Inspector Pearce a few weeks ago took occasion in an interview to show the hazards of the coal business as now conducted in the state of Indiana. Among other things, he said that in 1910 there were 182 mines operating in the state, employing 31,171 persons; whereas at the present time there are only 126 mines, employing 20,518 persons. He emphasized the fact that the production of coal has reached a deplorable state, and if continued will drive more operators into bankruptcy. The present situation not only results in waste of coal but destroys life and property, and makes idle each year hundreds of additional employees, until at last conditions have well-nigh become intolerable.

Mr. Pearce thinks that the Federal Government, as well as the officials of Indiana, should take cognizance of the evils of overproduction, which result in ruinous competition and waste of the coal resources of the state.

The more prominent operators are endeavoring to prevent ruinous competition in marketing their product, but have so far found little encouragement from either the Federal or state authorities in following such a course.

What is to happen to the coal producers in this state in the matter of marketing their production at profitable prices is a problem. It is a certainty that they will never be able to obtain better prices until they act more in coöperation, and it is just as evident that the spirit of cynicism, distrust and suspicion must be replaced by cohesion before better times are possible. The Indiana trade needs more than anything else a leader. There are men engaged in the state's coal industry qualified to lead and whom a great majority of the shippers and producers would follow. The commercial, financial and manufacturing world is replete with associations now doing effective work for their respective lines of business in this country, and when one looks into the demoralization and bankruptcies of the coal-producing industry of the Middle Western states it seems to show lack of leadership and a state of incapacity which is little less than criminal.

Deaths from Explosives and from Electricity

In a recent monthly statement of the United States Bureau of Mines compiled by Albert H. Fay is given an interesting table, here quoted, showing the conditions

It will be noted that comparatively few fatalities at coal mines are caused by the thawing of explosives and still fewer are due to unexploded charges in coal and débris. The total number of fatalities owing to shots breaking through the pillar between working places is 220, or 6.01 per cent., which shows how important is this matter.

CLASSIFICATION OF COAL-MINING CONDITIONS WHICH LEAD TO FATALITIES IN WHICH EXPLOSIVES CAUSED DEATH

State	Period	Handling Caps,		Premature Blasts		Blown Out or Windy Shot	Flying Pieces of Rock or Coal	Returning Too Soon	Blast Delayed	Shot Breaking Through Pillar	Suffocation by Powder Gas	Striking Unexploded Charge in Removing Debris	Drilling into Unexploded Charge	Miscellaneous	Total	
		Handling and Transportation	Detonators, Squibs, and Fuse	Thawing Explosives	Tamping											
Alabama	1894-1913	7	.....	.....	2	9	12	8	16	1	2	1	.....	.....	28	86
Arkansas	1905-1913	.....	.....	.....	.....	18	3	4	2	2	1	6	.....	9	15	15
Colorado	1887-1912	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	1
Georgia	1909-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	15	15
Illinois	1882-1912	86	1	.....	10	95	81	48	52	3	32	7	.....	14	25	151
Indiana	1891-1913	23	.....	.....	3	30	16	6	13	3	12	19	.....	2	11	138
Iowa	1881-1912	17	1	.....	2	20	4	26	5	1	4	1	.....	3	6	90
Kansas	1885-1912	14	9	.....	1	12	21	23	5	.....	4	30	.....	19	19	138
Kentucky	1884-1913	13	5	.....	.....	11	17	3	13	1	7	6	.....	5	10	91
Maryland	1883-1913	3	1	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	6	6
Michigan	1900-1913	.....	1	.....	.....	6	.....	2	.....	1	1	1	.....	3	15	15
Missouri	1889-1913	3	.....	.....	.....	4	.....	8	8	2	5	8	.....	1	4	43
Montana	1891-1913	2	.....	.....	1	.....	.....	1	3	.....	4	1	.....	3	3	15
New Mexico	1893-1912	.....	.....	.....	.....	4	5	5	1	2	1	1	.....	2	21	21
North Dakota	1908-1913	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2	3	3
Ohio	1874-1912	19	2	.....	.....	47	1	12	9	3	27	11	.....	.....	42	173
Oklahoma	1893-1912	16	1	.....	.....	9	19	14	10	3	6	6	.....	27	111	111
Oregon	1909-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania (anthracite)	1870-1912	320	10	24	80	570	.....	397	125	7	76	8	3	26	105	1769
Pennsylvania (bituminous)	1877-1912	50	6	1	2	34	13	30	19	1	24	3	.....	3	2	188
Tennessee	1891-1913	3	.....	.....	.....	2	5	2	4	.....	3	5	.....	25	49	49
Texas	1909-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	2
Utah	1892-1913	1	.....	.....	.....	3	.....	1	.....	.....	.....	.....	.....	5	5	5
Virginia	1899-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	10	10
Washington	1886-1912	2	2	2	1	.....	.....	.....	1	2	1	15	.....	3	3	32
West Virginia	1890-1912	54	4	2	3	29	6	2	7	.....	9	1	.....	1	29	147
Wyoming	1908-1912	1	.....	.....	.....	2	.....	.....	6	.....	1	.....	.....	2	2	12
Total	.....	636	45	30	112	908	203	592	300	32	220	130	3	71	379	3661
Percentage of total	.....	17.37	1.23	0.82	3.06	24.80	5.55	16.17	8.19	0.88	6.01	3.55	0.08	1.94	10.35	100

under which explosives and electricity caused death. The table that relates to explosives shows that 18 per cent. of the accidents occur during the handling and transportation of the explosives and approximately 25 per cent. may be grouped as due to premature blasts and short fuses.

The first dates in the table classifying electricity accidents are not those of the introduction of electricity into the mine, but are the dates when the first recorded accident from electricity occurred. The descriptions of the accidents in inspector's reports are in some cases not

CLASSIFICATION OF FATALITIES IN AND AROUND COAL MINES, CAUSED BY ELECTRICITY, SINCE ITS INTRODUCTION INTO THE MINES, BY STATES, SHOWING PERIOD COVERED

State	Period	Causes of Deaths														Total
		While Climbing on Car or Motor	While Riding Car or Motor	Direct Contact with Trolley Pole	While Replacing Trolley Pole	Contact with Walking Against Wire	Falling or Walking Against Wire	Trolley Stepping on Fallen Wire	Wire Repairing Guard Boards	Other Trolley Wire Cont'ts	Tool or Iron Bar Striking Trolley Wire	Contact with Mining Machine	Contact with Machine Feed Wire	Contact with Haulage Locomotive	While Repairing Line Wires	Miscellaneous Electrical Causes
Alabama	1905-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48	48
Arkansas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0
Colorado	1901-1913	.....	.....	.....	.....	.....	.....	.....	.....	9	.....	.....	3	.....	8	20
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0
Illinois	1903-1912	3	.....	.....	3	1	.....	.....	.....	5	.....	2	2	.....	1	17
Indiana	1903-1913	1	.....	.....	.....	.....	.....	.....	3	.....	1	1	.....	1	1	1
Iowa	1909-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Kansas	1895-1912	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	2	2
Kentucky	1906-1913	2	.....	.....	3	.....	.....	.....	12	.....	.....	1	.....	1	.....	18
Maryland	1906-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0
Michigan	1906-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	3	5
Missouri	1912-1913	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	1
Montana	1906-1913	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	1	0
New Mexico	1899-1912	.....	.....	.....	.....	.....	.....	.....	23	4	2	21	.....	1	1	0
N. Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2	1	1	3	54
Ohio	1896-1912	.....	.....	.....	.....	.....	.....	.....	.....	2	3	3	1	1	3	10
Oklahoma	1898-1913	3	.....	.....	.....	.....	.....	.....	.....	1	.....	1	2	1	3	10
Oregon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0
Pennsylvania (anthracite)	1898-1912	2	.....	.....	6	1	2	3	1	.....	4	2	1	10	32	32
Pennsylvania (bituminous)	1896-1912	32	7	9	73	.....	2	15	32	11	54	1	7	13	256	256
Tennessee	1903-1913	1	.....	.....	.....	.....	10	.....	1	5	.....	.....	.....	17	17	17
Texas	1909-1913	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	1	1
Utah	1911-1913	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	14	14	14
Virginia	1899-1913	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	14	14
Washington	1906-1913	3	1	1	1	1	1	5	3	.....	30	3	1	1	5	115
W. Virginia	1899-1912	7	8	4	1	1	1	43	9	3	1	3	2	1	2	3
Wyoming	1908-1913	1	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	3	3
Total	.....	44	27	14	90	3	5	128	50	25	126	6	13	111	642	642
Percentage of total	.....	6.85	4.21	2.18	14.02	.47	.78	19.94	7.79	3.89	19.63	.93	2.02	17.29	17.29	100

Of course some of the causes overlap slightly. For instance, "Returning too soon," "Flying pieces of rock or coal," "Blast delayed" and "Suffocation by powder gas" might generally be classed under the first head. In compiling the table the statement of the inspector has been taken as establishing the preferable classification.

sufficiently clear. For this reason the "miscellaneous" list is somewhat large and constitutes 17.29 per cent. of the whole. Contact with machine feed wire and walking or falling against trolley wires are the leading sources of accident. Contacts with feed wires caused 126 deaths, while 361 men died from touching trolley wires.

Coal Mining at the Panama-Pacific Exposition

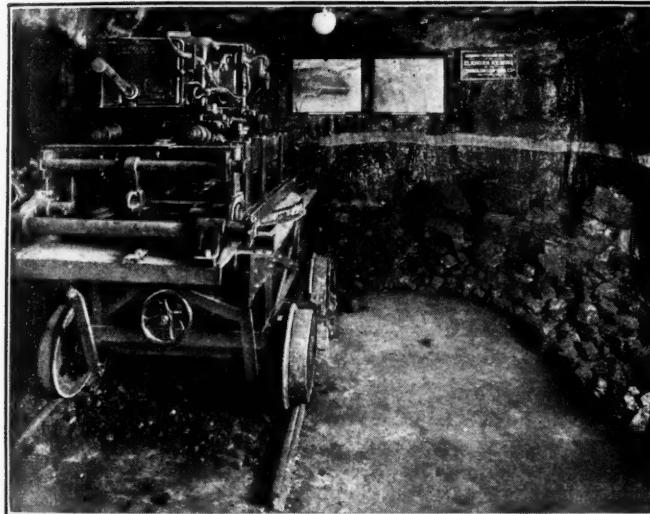
SPECIAL CORRESPONDENCE

SYNOPSIS—There are a number of interesting and instructive exhibits arranged by various coal companies and machinery manufacturers. Moving pictures play an important part in the educational work.

A person whose primary interest is coal mining might naturally assume that in an exposition located on the Pacific Coast and so near the stirring scenes of '49 there would be little of interest to a coal man and pertinent to the coal industry. Such, however, is far from the case, and no place on the entire exposition grounds attracts more interest or has a greater number of visitors than The Mine, which was illustrated and briefly de-

sized scale coal-mining methods as carried on in West Virginia, Kentucky, the anthracite region of Pennsylvania, the Rocky Mountain coal fields and the mines of the Pacific Coast.

An interesting exhibit is that of the Consolidation Coal Co. in the Elkhorn coal field of Jenkins, Ky. The mine represented produces gas coal and an excellent byproduct coking coal that is of particular interest at the present time owing to the shortage of coal-tar products. A Jeffrey-Drennan turret coal cutter is shown cutting in a band half way up the coal section. Although the ribs are of painted canvas, the effect is realistic, the realism being enhanced by the piles of coal about the face and ribs and by the turret cutter and a portable electric pump exhibited at the rear of the coal cutter by



CONSOLIDATION COAL CO.'S EXHIBIT, SHOWING TYPICAL ROOM IN ONE OF ITS ELKHORN, KY., MINES

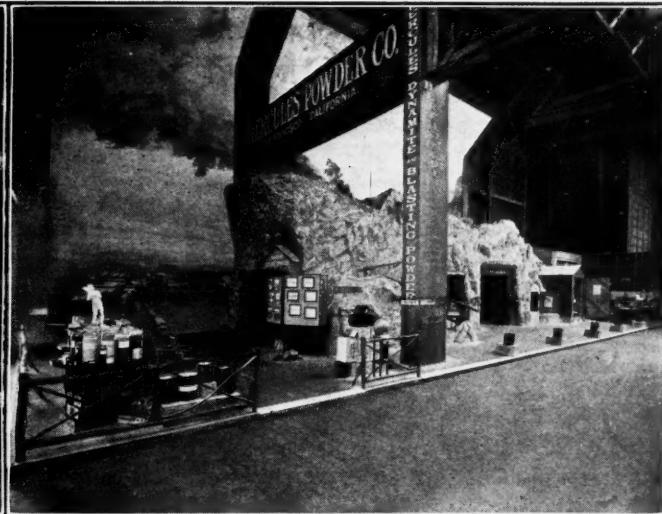


EXHIBIT OF THE HERCULES POWDER CO., SHOWING MODEL OF A BLACK-POWDER MILL

scribed in a recent issue of *Coal Age*. This exhibit alone is worthy of a more extended notice, and moreover coal mining is shown not only in The Mine but in a number of other interesting ways.

The Mining and Metallurgical Building covers an area of 112,555 sq.ft., is located directly on the Marina, overlooking San Francisco Bay, and its north portico is one of the most advantageous locations from which to view the daily flights of the airships. The building contains not only mining exhibits, but also such allied displays as those of the United States Geological Survey and the United States Mint. There are also other Federal exhibits, such as the model post office of the United States Post Office Department.

EXHIBITS ARE PRACTICAL AND EDUCATIONAL

The exhibits in the mining building are essentially educational in character, and there is a pleasing absence of mere piles of ore, rock and coal that so often make an exposition seem little more than a glorified stone quarry or coal yard. Seldom is it possible to see side by side in close and striking contrast and upon a full-

the Fairmont Mining Machinery Co. A shortwall Jeffrey coal cutter forms part of the exhibit of the Pocahontas Consolidated Collieries Co. in room 11.

Another exhibit shows the method of mining in a pitching seam as carried on by the Pacific Coast Coal Co., of Seattle, Wash. The face is reached through an inclined chute, which is steep and low, so that only those visitors will see the actual working conditions who are willing to climb up the chute at some personal inconvenience. The realistic reproduction in The Mine of underground conditions is shown very well in an exhibit of a Baldwin-Westinghouse electric locomotive hauling a car along the mine entry.

Mine-safety devices, safety lamps and electric danger signals are shown in The Mine by the Life-Saving Devices Co., the Concordia Safety Lamp Co., the Mine Safety Appliances Co. and the Baldwin Carbide Lamp Co. Some of these companies also have exhibits on the main floor over The Mine, where are also shown oxygen-breathing rescue apparatus of the Draeger, Fleuss and Westfalia types. The realism of the mine is carried out by the use of safety lamps in many places, and many

visitors are provided with them as they enter the mine. Many of the guides are dressed as miners, and as The Mine is in made ground and below the water level of the bay there is a very distinctive mine odor.

The Bureau of Mines shows in a case an excellent exhibit of safety lamps and other lighting devices, and by means of a working model the dust-distributing device of George S. Rice, chief mining engineer of the Bureau.

MOVING PICTURES MUCH IN EVIDENCE

One of the most striking advances to be noted in the Panama-Pacific Exposition is the extensive use of moving pictures, mainly as an educational feature, with the advertising feature absent or only very incidental. In the Palace of Mines three moving-picture shows are in almost constant operation. One of these in The Mine shows scenes from practical mining and quarry work, another on the main floor shows general technical and geological films, while in still another in the other end of the building and forming part of the exhibit of the United States Steel Corporation are shown many phases of the mining of coal and iron ore, the coking of coal and the manufacture and fabrication of iron and steel.

One of the novel features of the mining exhibit is the White ambulance and rescue truck of the Bureau of Mines. This is equipped with oxygen-breathing apparatus, first-aid supplies and other rescue appliances, and twice each day, at 11 a.m. and 2 p.m., it is brought into use as a part of a rescue and first-aid demonstration. At these hours a loud report is heard and smoke issues from The Mine, whereupon the rescue truck and corps dash up to the north entrance of the building, the rescue men don their apparatus and the corps enters The Mine and soon returns with the supposed victim, who is placed on a raised platform and first aid given to him. This demonstration never fails to attract a crowd.

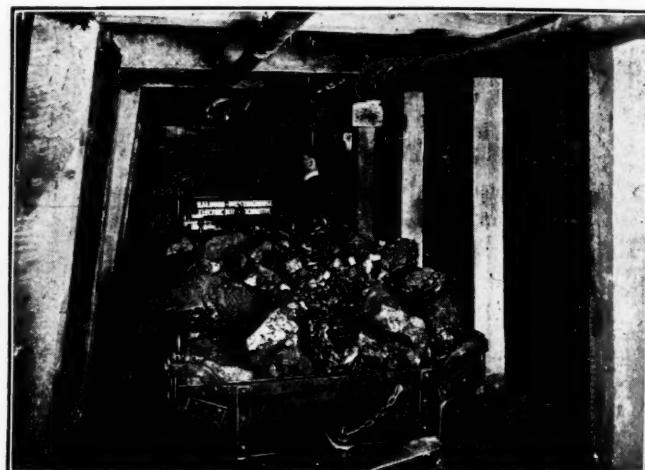
The Consolidation Coal Co., in addition to its display in The Mine, has an excellent exhibit of photographs and charts near the south entrance to the mining building, and in this same space are shown some very large blocks of coal that must have been extremely difficult to mine and transport to San Francisco.

The United States Steel Corporation coal-mining interests are represented by numerous photographs of the H. C. Frick Coke Co., the Bunsen Coal Co., and the National Mining Co. Samples of coal from various districts are also shown. A most interesting model shows a complete modern coal-and-coke plant, $\frac{1}{6}$ of full size, having a capacity of from 1,200 to 1,300 tons of coke per day. The headframe and coal bin are of steel all foundations and the shaft lining of concrete, and the subsidiary buildings, such as boiler, engine, oil, supply lamp and other houses and shops, are all substantially constructed with galvanized corrugated roofs. A hot-gas flue conducts the oven gases to the boilers. The ovens are mechanically operated. In this model, which was awarded a "Medal of Honor," great prominence is naturally given to the many uses of steel and concrete in a modern coal mine. All mine cars are of steel, with steel wheels, and in The Mine the shaft bottom and all pump rooms, stables, mine offices, engine rooms, first-aid rooms, air bridges, overcasts, etc., are of either steel or concrete. Steel mine timbers and ties are also much in evidence. The transportation of coal and ore is illus-

trated by many photographs and models of lake carriers. One of the most attractive exhibits in the mining building is that of the Hercules Powder Co. It includes the ingredients and finished products for a number of different explosives, a working model of a black-powder mill, the methods of testing detonators, a magazine, and the methods of using explosives, the whole forming an unusually complete and instructive exhibit. This company also has a magazine in The Mine.

EXHIBITS COVERING WELFARE WORK

In view of the great advance made along sociological lines in connection with mining since the St. Louis Exposition, one naturally looks for prominent welfare exhibits. The Bureau of Mines has displayed a number of photographs and a diagram of a model mining village, with the principal welfare points prominently brought out. In the United States Steel exhibit a large section is devoted to the welfare work as carried on by the various subsidiary companies comprising the corporation.



SHOWING A BALDWIN-WESTINGHOUSE ELECTRIC LOCOMOTIVE HAULING LOADED CAR ALONG ENTRY

No special prominence is given to the mining part of the work, but large numbers of photographs and a few models illustrate the safety-first campaign.

The methods used to impress the necessity of "safety first" are illustrated by photographs, transparencies and tabulated data. The several phases illustrated are first-aid crews, rescue crews, rescue cars, emergency-dressing stations and hospitals. The subject of sanitation is also taken up and typical bath and change houses, sanitary drinking fountains, modern houses, etc., are shown. Model gardens and mining towns are likewise shown, also the work of district nurses, children's playgrounds, club houses, etc. In fact every feature of mining and metallurgical sociology is well illustrated.

■

In Some Mines the proposal to institute extensive watering of the roadways to counteract the influence of coal dust directs attention to the question of miner's worm disease. The removal of one danger by such means it is feared may introduce another evil, especially in deep warm mines. It may be that miner's disease is not likely to spread extensively in pits where the temperature can be kept below 64 degrees, also that it cannot exist in very dry pits; but the experience in Germany is to the effect that it spreads rapidly after the system of watering the dust to prevent dust explosions is introduced. Investigation has shown conclusively that the danger from the worm is greatest in warm and moist pits, and the effects of watering must be more closely watched when so much of the coal is being extracted from great depths.

Supervision of Mining Details

BY G. S. BRACKETT*

SYNOPSIS—Mine operation as usually practiced requires the performance of much dead work or work which does not directly contribute to production. If the "floating gang" could be eliminated, either wholly or in part, and necessary repairs carried out under the direct supervision of the foreman, expenses might be decidedly reduced.

Suppose you could lift the cover off your mine and watch each detail of the production of coal and each movement of your employees from starting time until evening. Suppose that you could give the same supervision over your employees that exists in a department store or a factory. There is no doubt that your cost of production would be less; but our efforts along this line can only be approximations. These methods can, however, be approached as closely as possible, but we face the danger of paying more for bosses than is harvested in results.

A well-managed and well-equipped factory has practically every effort directed in the production of the finished product, ready for shipment, and every employee is under almost constant supervision, with their labors computed from a time clock. Repairs are mostly done by laying a piece of machinery idle, and every extra piece of work outside the actual production has the careful attention of the management as to its estimated cost and most opportune time of accomplishment.

Many mine employees work by the hour, and the only guarantee of their productive ability or efficiency is the foreman's judgment, from time to time, of the amount of work accomplished. Even if the foreman is an excellent judge, a certain period of time has passed and some labor has been wasted before further loss is eliminated. This time is probably considerable, as a careful foreman wants to be sure he is not unjust. The actual loss is never recovered.

PAYROLL COSTS

The payroll costs at a mine may be divided into the following four general heads, subject to any subdivisions each management desires:

A. The cost of management, office and supervision at the mine, including all expenses which continue regardless of the production. Under this head come pumpmen, stable men, bosses, firebosses, electrician, and in many cases the power house.

B. The cost of mining the coal and placing it on board the mine car at the working face.

C. The cost of transporting the coal from the face and loading onto the railroad car, including drivers, trappers, duffers, trimmers, motormen and brakemen, but only those who are directly connected with the movement and handling of the coal.

D. The cost of all other labor (such items as may be dispensed with, even if only for a short time, without interrupting the movement of the coal)—trackmen, timber men, road cleaners, brattice men, ditchers, electrician's help, etc.

Eliminate the last division (D) and dispense with all employees classed therein—what would happen first and what would be the ultimate result? Every superintendent has his own problems and his own opinions, and the answer would be different in many cases. The following order of events may serve to approximate the happenings in some mines:

1. One miner goes home for the want of a crosscut turn or switch.
2. Another cannot work because of a fall in his working place.
3. The lack of a brattice on one of the headings prevents its working.
4. A bad piece of roof along the heading cannot be timbered.
5. A loaded car off the track and nobody to help replace it.
6. Mining machine broken, pump grounded, motor armature burned out—no electrical help.

7. Headings gobbed, ditches choked and men quitting. There is no economical argument in favor of permitting a mining plant to depreciate. To be efficient it must be in good repair in every respect. This article is a plea for better mining conditions at the same cost, which may be interpreted as meaning the same conditions at a less cost.

All the aforementioned difficulties and more are being met daily in different parts of many mines, and in many cases the work cannot be done promptly. Why not consider almost every item much on the same principle as we would the renewal of a pipe line some time next month or the month after, at an opportune moment when the work may be done economically—the same as the repair of a certain piece of machinery in a factory or the changing of a counter in a department store?

There would have to be an idle working place or two kept in condition for the use of miners who for some reason or other are unable to work in their own places. The idea is to get this class of work, or as much of it as is possible, done at a time when the mine foreman or his assistant can be there to see it properly completed, by some miner picked from that immediate section, allowing him the actual time consumed in the work or the estimated cost thereof.

There are many miners who would be glad of these extra earnings made between driver's trips or while waiting for the mining machine, without interrupting their regular duties. The individual, aside from his work at the face, has the means of increasing his income.

The same policy may be applied to most of the other happenings. It will be cheaper to pay some of the miners their just earnings for helping put a car on the track than it will be to bring the track or timber gang there for that purpose, and there is not nearly so much lost motion in its accomplishment. An extra mining machine, an extra portable pump and some spare armatures relieve more of the difficulties. Can you imagine the comfort and security the superintendent, foreman and electrician would feel in the fact that there was duplicate equipment on the job to meet the majority of emergencies? Under

*Engineer of Mines, Flemington, W. Va.

such conditions the work could be done more efficiently and at a less cost.

If you do much writing you will probably have several pencils, all sharpened, so that when one becomes dull you can promptly pick up another. When you have a little time you sharpen them all or all that need sharpening.

Your mine men have to repair their equipment (sharpen their pencils) after work hours or hurriedly during the operation of the mine in order to lessen the delays as much as possible. They work under difficulties, interruptedly, and your force has to be greater to meet emergencies. There is no legitimate reason why a great deal of this class of work cannot be done under favorable conditions and at an opportune time, properly and carefully.

A RECORD OF WORK ACCOMPLISHED

Examine your day force critically—every one not directly connected with the movement of the coal. What are they doing and what percentage of their time is actually consumed in their work? The foreman will tell you they cleaned up a fall on a heading, put a turn in a crosscut, fixed a piece of track and finished out the day in a certain ditch.

Can you imagine any more ineffectual method of accomplishing this work? How much time is spent in movement from one place to another, changing tools or in the interruption of one duty to perform another of more importance, and how much in simply finishing out the day? What is the most economic way of doing each and every item that is to be done, considered separately? These are questions for the management of every mine, and each item of work should be taken up independently and its performance and completion provided for irrespective of interruption.

Should a pump break down you would not deliberately send for the maker to come to fix it. His entire interest would be to put in as many repair parts and as much time as possible, without being sure the parts and work were necessary. Yet on a bad piece of track the same track gang that miserably laid it returns to make the repairs, and their entire interest is to continue the repairing, for therein is their daily bread. It is to the interest of the driver to tear up a piece of track by derailments for his "buddy" the track man to fix; the miner to produce a fall for his cousin the slate man, or to break his roof for a friend the timber man.

By the elimination of the employees listed under division D the bare operating costs show a surprising reduction. There is work along the track or in the ditches that needs attention, and the foreman has a notebook in which these are listed. A small percentage of the mines work every day, and on the first idle day he has an opportune time to cross several from his list. The labor has cost him a minimum and is properly done under his direct supervision.

It is a common fallacy among operators to "cut" everything off during an idle day or two in order to economize. They are practicing the most expensive method of operating. When the foreman's attention is engrossed in his necessary and profitable duties of getting the coal over the tipple he is flooded with an abundance of labor in ditches, timbering, track laying and bratticing, to idle away time in a crosscut or hide in the air course. When the mine is idle and he has the time to attend to these labor

expenses, his hands are tied; the money has been spent and little has been accomplished.

The ideal condition of eliminating all regular employees listed under division D may never be fully reached, but the closer they are approached the more will be the economy, the better the conditions and the closer will we reach the coöperation of all employees for their own and the company's advantage.

In experimenting with this system one noticeable advantage is the tendency to do each job thoroughly and completely. Gradually the foreman and his assistants are working their way out of the usual mining difficulties and their troubles are diminishing.

Western Coal-Rate Advances

BY H. S. MIKESELL*

The Western rate situation, so far as it affects Illinois coals, is still receiving considerable attention. It is now definitely understood that the advances will be checked in by all the lines interested and will become effective probably Sept. 30; but if not then, certainly on Oct. 30.

Officials representing the southern Illinois carriers express themselves as feeling reluctant to take this step and are greatly disappointed over their failure to secure additional revenue on livestock and packing-goods products. Some of them intend immediately to petition the commission for a rehearing on these items, and if necessary they will consent to reopen the whole case on all commodities. To be consistent, they must of necessity show evidence of their intention to avail themselves of the relief previously granted by the commission by actually advancing the rates on coal.

Some of the roads intend to attempt to secure a continuance of present rates on fine coal—that is, Nos. 2, 3, 4 and 5 washed sizes and screenings. The Illinois operators have been asking special consideration and protection on these sizes, which become the maximum burden at the time that the advances go into effect.

It is not unlikely that if a rehearing on the 5-per cent. case is denied, or if additional hearings are granted and further awards made on the other commodities, some of the roads may feel warranted in reestablishing the old rates. The situation is still involved and full of complications, but inasmuch as considerable tonnage originates at southern Illinois mines it is apparent that it is the purpose of some of the carriers not to jeopardize the movement of this tonnage at the new rates.

Wanted--An Engineer

Important and responsible mining interests wish to employ a safety and efficiency engineer who is thorough, experienced and fully acquainted with general mining conditions in the United States. The man desired must be entirely familiar with all devices of life-saving practice such as are adapted for the prevention of accidents in and about mines.

Anyone who feels qualified to make application for this position should write to the Editor of *Coal Age*, stating briefly his experience and training in the lines designated. All applications will be kept in strictest confidence and will immediately be sent to the people desiring such a man.

*139 West Van Buren St., Chicago, Ill.

Distinction Without Difference

A competent man, an auditor, recently resigned from a company with which he had been associated for a long period of years. A friend, surprised at his action, asked him his reason for leaving.

The reply was brief, but seasoned with wisdom and to the point.

"I was in the wrong end of a good concern and I wasn't paid for my work like the fellow in the operating end. There was nothing ahead for me."

The man who asked the question—and who, by the way, was the president of a coal-mining concern—was struck by the answer, for he knew from experience that correct principles and practices in accounting are just as essential and worth as much to the life and future of a coal-mining company as a good engineering and operating organization. It was not long before his own auditor received a raise.

It is to be wondered why so many business men of sound judgment as to the selection of coal fields, markets, operating organization, etc., will so often give the accounting side of their business venture but little thought. They seem to forget that the very life of the concern must and does depend on whether it is conducted along sound accounting lines. How many coal concerns have gone to the wall because no provision was made in the accounting methods to provide properly for depreciation or not at all for extraordinary contingencies, such as fires, floods, strikes, explosions, etc.!

The trouble seems to be that a distinction has been created and a line drawn as to the value of operating methods and men as compared to accounting men and methods, as if there was a great gulf of difference between them, when as to their importance in the successful conduct of any business there is none.

Ask any live manager of nearly any coal concern if the cost sheets he looks over every month, and from which he figures what he can sell his product for, really represent all the cost. If he's honest he will tell you "No." With all his business acumen he is deliberately pursuing a course that he knows is wrong.

Why does he do it?

Because he too is in that rut of thought which draws a wide distinction between the value of sound accounting methods and principles as compared to the side of his business that is all action and filled with tonnage figures. This blinds him to the true value of the quiet accounting end of the business.

Coal-mining men especially have got to cut corners pretty fine to keep up with the procession. That they are so often misnamed "barons" is, more than anything else, due to the fact that neither the owners, stockholders nor the public have been taught that it is proper to pay a greater amount of attention to correct balance sheets than to total tonnage figures.

Too often a man with a coal mine is like a man with an automobile—he is considered well to do when really he is anything else.

It is time we began to quit drawing distinctions when no difference exists. When we adopt such a policy, the right kind of auditors will be greatly in demand and will be paid in proportion as much for their work as managers and superintendents are paid for theirs.

**Pages from a Miner's Notebook:
Efficiency**

Efficiency, to the modern efficiency engineer, is the means to an increased production with the same number of men in the same, or less, time. To me efficiency is summed up in doing my day's work well, or even a little better than yesterday, with the least possible expenditure of energy and exertion. I spoke of this today to two of my fellow-workmen.

One of them laughed. He is a big, burly Italian who works in the next place. I hear him all day long rushing about, humming or singing snatches of song in his native language—now here, now there, always in a hurry and fury of endeavor. He is a good workman, and works very hard. Digging a little coal here this minute and the next running across the room to dig a little there; pushing his cars to the face on the run almost; loading them in record time and dropping them to the turn; carrying up his timber as he needs it, dragging in his rails, rushing for his track hammer over there and his spike bar and bucket of spikes elsewhere—using brute strength in his every action and accomplishing his day's work in good time and in good form. He earns as much as I, probably more some days, and his place is a model of safeness and neat workmanship.

My other friend nodded his head thoughtfully. He is a young German, not many months from the Fatherland. His place is some little distance from me, yet occasionally I find time to drop in on him. I enjoy his frank criticism of our methods of mining and our customs in general. He never seems busy. Always cool, always in action and making every motion lead naturally to the next, he loads his turn with seemingly the least possible exertion. He has coal dug and laid by and when not at other work he is in the cut, always working ahead, always paving his way to a better day's work tomorrow.

His timbers are all put into the cars he pushes to the face; and he always has a few in readiness. His rails are brought in in the same manner. His ax and saw and measuring sticks are always together in a convenient place, and his track tools are seemingly inseparable. He does not sing, but his cheery low whistle is always to be heard. His day's work accomplished—as much and as well as my neighbor's—he comes out of the pit with shoulders back and head erect, always ready for a friendly tussle or a frolic, and with, I imagine, a sense of accomplishment equal to that of the man who laughed at my idea of efficiency.

There is little difference in their earnings. They have each done a good day's work. Yet one of them is a better workman. Which?



Cleaning a Centrifugal Pump—At the Johann Deimelsberg mine, in the Werden district, Germany, a centrifugal mine pump, which had to raise 6 cu.m. of water per minute to a height of 250 m. worked under considerable disadvantage on account of mud clogging the pump. In order to prevent this deposition, the following plan was adopted: After the centrifugal pump had been stopped the slush which collected in the pump was drained and clear water substituted, 1½ to 2 liters of mineral oil was added and the pump put in motion and worked in dead water for a few minutes. Water and oil were thus mixed and all the internal parts of the pump wetted with the oily water. After the pump was stopped again, this oily water was allowed to remain inside the pump until it was put in use again. Since this process has been followed regularly the clogging has ceased and the pump can be used steadily and with very little attention.—"Mexican Mining Journal."

Stresses in the Mine Roof*

BY R. DAWSON HALL

SYNOPSIS—There is a regular procession of collapses in the mine roof, and there are new structures resulting from each collapse. The failure of the roof is progressive. From its first condition as a holoid, it becomes in turn a pyroid, a cumoid and a conchoid, and then fails completely.

The stresses in the simplest structures are often those which we find most difficult to analyze. Thus the most complex condition in mine stresses is found in simple tunnels where the roof, the sides and the floor are a monolith. The functions of the parts are like the parts them-

an action of parts with specialized functions as if the structure treated were a roof beam with independent supports resting on a detached foundation. The problem cannot be ignored on the ground that it is not of sufficient importance to warrant careful consideration, because conditions of complete monolithism, of which the tunnel is the type, are found materially unchanged in room-and-pillar and in longwall work.

HOLOID OR TRULY MONOLITHIC ROOF

This unity between roof, sides and floor, which to the coal miner is a difficult conception, really deserves a scientific appellation, and perhaps holoid (from *holos*, whole, and *eidos*, form) will serve the purpose as well as any other.

In a simple tunnel the roof, the sides and the floor form integral parts of one and the same structure, and the distortion of one cannot be conceived without a consequent strain in the others. Thus when the roof of the tunnel droops by reason of its weight, the upper parts of the sides are drawn in because they are integrally connected with the roof and must approach each other whenever, by the sagging of the roof, the distance between any two points in it is diminished (see Fig. 1).

The sides in their turn operate on the floor of the holoid structure, producing a tensile stress. The value of soap as a means of illustrating the action of mine stresses has for a long time impressed me. With that idea in mind a cake of naphtha soap measuring $4\frac{3}{8}$ by $2\frac{1}{4}$ by $1\frac{3}{4}$ in. was taken and a rectangular hole representing a tunnel was made through it $1\frac{3}{4}$ in. long, $2\frac{1}{2}$ in. wide and $1\frac{1}{4}$ in. high (see Fig. 2). A load was then placed at the mid-span of the tunnel. Eventually, the upper bar, or "roof," broke at the center line and along both "ribs" of the tunnel, the breaks being approximately vertical and proceeding, as might be expected, on the ribs from the "surface" downward and at the center line from the tunnel upward, the failure being from bending moment, not shear.

This is interesting because it shows that breakage at the ribs is not necessarily evidence of shear. It may be only a demonstration of a holoid structure. It is the form of failure whenever coal is blasted down and not an infrequent form of roof demolition. The test

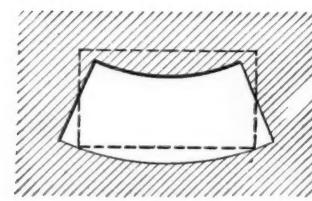


FIG. 1

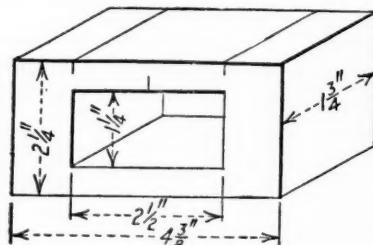


FIG. 2

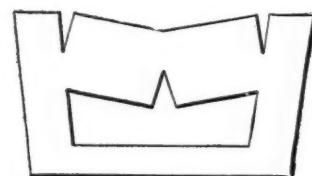


FIG. 3

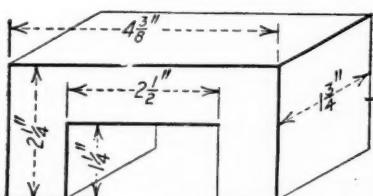


FIG. 4



FIG. 5



FIG. 6

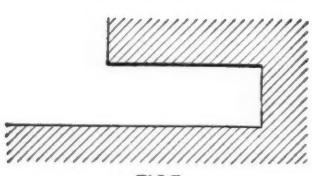


FIG. 7

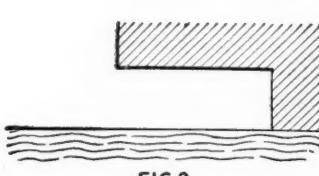


FIG. 8

FIGS. 1 TO 8. ILLUSTRATION OF PRIMARY ROOF STRUCTURES

Fig. 1 shows in broken lines a cross-section of a tunnel, and in full lines the same tunnel distorted by pressure. This is a typical holoid structure. Fig. 2 shows a soap model to which reference is made in the article. Fig. 3 exaggerates the upper or roof bar in the soap model and shows how the collapse of the roof forces back the sides by the arch action. Fig. 4 shows the soap pyroid without load. Fig. 5 shows the same when the bending of the roof bar takes place, thrusting out the ribs, or legs. Fig. 6 shows a further action when the revolution of the segments in collapse tends to force back the upper parts of the ribs, or legs. Fig. 7 illustrates a semi-holoid structure. Fig. 8 illustrates a semipyroid structure.

selves not distinct and specialized, and the problems to be solved are largely indeterminate, like those in a metal structure with riveted joints or a redundancy of bars.

This difficulty explains perhaps why the condition has not been treated. But just because it cannot be discussed in its entirety is no reason why it should be regarded as

on the soap tunnel further showed that as soon as rupture takes place in the roof of the tunnel, there must inevitably come a thrust on the ribs. The tension draws them together till rupture occurs and then the two roof units, endeavoring to revolve, crowd each other and push on the opposing walls (see Fig. 3).

When a holoid structure, by reason of the weakness of the floor or because of a lack of adhesion between the ribs

*Article presented at the San Francisco meeting of the American Institute of Mining Engineers, September, 1915.

and the floor, ceases to engage the floor in its movements, then its shape as a structural element roughly resembles the Greek letter π and for want of a better name we might term the new element a pyoid structure (see Fig. 4). The doctors use the word for a totally different purpose with little excuse. "Pyonoid" is the word which they should use to express the attributive "pus-like."

By reversing the soap tunnel after the roof has been caved the weakness of the pyoid structure is made clear. As soon as pressure is brought on the new roof (formerly the floor of the tunnel), the two ribs are seen to recede markedly and it is evident that when the floor is intact there must be a well-developed stress in that element of the holoid structure (see Figs. 5 and 6, showing progressive demolition).

Probably it is well here to express a belief in the importance of the holoid. The general notion is that all the beds shear horizontally along the lines of stratification and that it is a mistake to consider the mine or even the

of its occurrence and the conditions under which it will develop vary with the materials under consideration.

HOW HOLOID STRESSES TEAR SLABS OFF RIBS

It is obvious that with the holoid structure, the ribs being drawn together by the movement of the roof, they must tend more or less to be split vertically and in long-wall they will then fall down on the advancing undercut. In certain sub-bituminous mines I have noted a tendency toward what I thought was a vertical shear parallel to the headings. This developed rapidly after the work was opened, especially at great depth.

Whether this was only a vertical shear seems doubtful. It may have been due to the holoid character of the structure, the ribs receiving no relief by a horizontal shear between ribs and roof. Instead the roof pulled off the edge of the pillar as the former bent under the load. It was interesting to note that these lines of fracture did not coincide with the normal cleavage of the coal.

The rending along vertical planes eventually throws back the real rib lines far into the pillar. Where the draw slate and roof proper leave one another, we have probably a plate structure superposing one which is holoid or pyoid in character, and in the long-wall the breaks back of the face which bring coal and roof down together, or which tend so to do if the latter is not

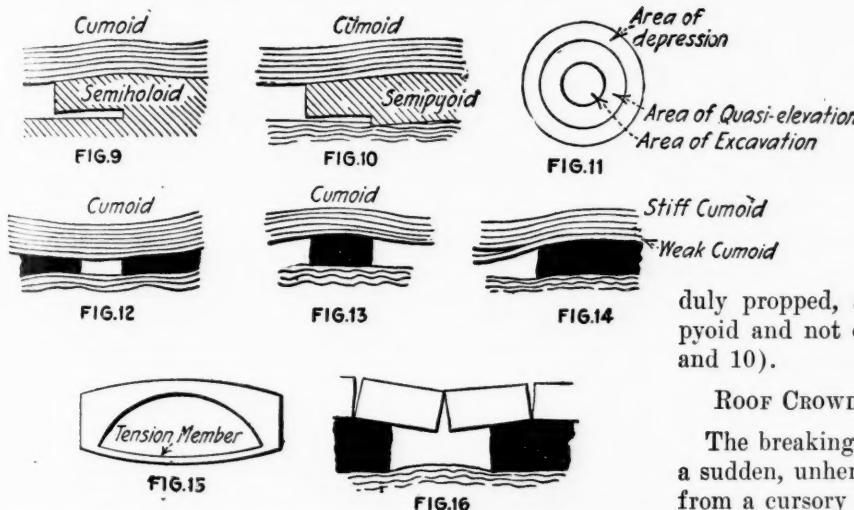
duly propped, are failures of the semi-holoid or semi-pyoid and not of the plate structure above (see Figs. 9 and 10).

ROOF CROWDS BETWEEN RIBS AND MAY NOT FALL

The breaking of even the holoid roof is not necessarily a sudden, unheralded event, such as one might anticipate from a cursory consideration of the problem. It is clear that the action of the moments cannot destroy the roof without revolving in a degree the elements into which the roof is broken, and any revolution inevitably binds these elements against one another so that they are less able to fall. Either a recession of the ribs or a further demolition of the revolving elements must take place or the roof cannot descend. One form of demolition which frequently occurs in shallow workings is vertical shear extending the cracks already made by the bending-moment stresses. But horizontal shears may make it possible for the roof masses to revolve and yet fit the space they occupied by a counter revolution of the strata past each other. Or again, the whole mass may be broken up by the rubbing of the opposing faces of the elements as they try to fall.

It is this last action which is in evidence in coal brought down by a shot when it is broken considerably in falling, and that vertical shear is not an important cause of the fall of coal is shown by the fact that there is a distinct tendency for the coal to roll away from the side ribs.

It is necessary now to consider the plate structure in which the roof is considered as a vast plate, a monolith in itself but resting without adhesion on its supports. Whenever there is a mined area the roof is depressed, and being elastic it tends to rise on the surrounding supports, resting its weight on the edges of the surrounding ribs of the excavation. This area of quasi-elevation is followed by another area of depression surrounding the central depression and the area of quasi-elevation. Thus



FIGS. 9 TO 16. SHOWING LATER STAGES OF DEMOLITION

Fig. 9 shows a semiholoid such as often occurs in longwall, supporting a cumoid which, being separated from the semiholoid, has freedom of movement except for the restraint of frictional contact. Fig. 10 shows a semipyoid likewise surcharged by an independent cumoid. Fig. 11 is a plan of a circular excavation. The sagging of the roof into this area produces an area of quasi-elevation; that is, an area which would be elevated if the mineral itself and the floor surrounding the excavation were incompressible and indestructible. Outside this area is one of depression, the stiffness of the measures lightening the burden on the area of quasi-elevation and loading with increased heaviness the edges of the excavation and the area of depression. It exhibits the fact that the action of the roof is cumoidal, or wavelike, and not confined to the area of excavation. The depressed area is in its turn followed by another area of quasi-elevation, and this again by an area of depression. The size of these waves of course decreases as the area of excavation is left behind. Fig. 12 shows a cumoid bending over an opening and crushing two pillars. Fig. 13 shows a cumoid bending over a pillar, the center of which is a point of quasi-elevation. The roof tends to break over such a support. Fig. 14 shows a weak cumoid, such as a loose draw slate which has broken away from the stiffer cumoid above and probably has insufficient moment of inertia for self-support. Fig. 15 is a Luten bridge, showing the lower tension member, or paving, which ties the abutments together and prevents their recession, thus adding to the strength of the bridge. Fig. 16 shows a broken cumoid failing to fall owing to an arching action.

roof as a monolith. It is true that most of the accidents in mines are due to the lack of unity in the roof. What we call draw-slate accidents are almost wholly due to this fact. Nevertheless, it is interesting to note how firmly roof and coal are usually "burned" to one another. Even when undermined and sheared on both sides the coal often fails to fall, being supported by the vertical shearing strength of the one side still attached and by the adhesion to the roof. I am hardly prepared to state when the holoid structure ceases to exist, and of course the time

the roof plate is bent into a series of waves around the central area of disturbance just as the surface of the water is rippled round the point where a stone has fallen and disturbed its equilibrium (see Fig. 11).

Of course, the elevations are only relative, not actual, and naturally, like all undulations, as they recede from the point of disturbance they die down. But it is essential to remember that while the holoid structure is to a large extent a closed force chain, this is not nearly so true of the roof plate, the stresses in which are less localized and circumscribed.

THE CUMOID, WAVE-LIKE OR PLATE STRUCTURE

This structure we may dub as cumoid (from *kuma*, a wave). The remarkable feature about such a structure is that it develops points of great stress far away from the disturbing cause, and it may break over the pillar instead of in the opening. The appearance of the Forth Bridge, Scotland, is known to almost everyone. The light structural work over the midspan contrasts most forcibly with the heavy structure over the piers. It is the case with all cantilevers and continuous-arch structures, and the roof in the mine is like a continuous arch, only it is continuous not only in one, but in every direction.

It is the peculiarity of the cumoid structure that the stresses it involves may be greater farther from the point of disturbance than at some nearer point. But, like the holoid structure and the pyoid, it puts the greater burden on the pillar's edge. The center of the pillar between two large open spaces may be relieved from much of the normal pressure because of the bending of the cumoid roof over the pillar (see Fig. 13).

There is some evidence that in actual operations in some sections of the country the roof soon breaks by horizontal shear into two or more separate cumoid structures, of which of course one is free of external load, while the others, though below other cumoids, may or may not be loaded over the unsupported area. If the stiffness of the upper cumoid, or cumoids, exceeds that of the lower, the loading may be relieved from the open spaces and the upper cumoids may restrain the lateral, and therefore the vertical, movement of the lower cumoids, thus adding to their resistive strength.

REASONS WHY ROOF FAILURE MAY SPREAD

In an interesting paper read before the winter meeting of the West Virginia Coal Mining Institute, the late F. C. Keighley called attention to the fact that when the lower roof broke or was preparing to break in the mined spaces of the Connellsville region it frequently weakened the lower roof in the rooms and headings nearby, despite the strong support afforded by large pillars. This caused in the narrow places many falls which had to be loaded out.

It would seem, therefore, that the breaking of the lower roof or its initial stressing tears the lower roof from the upper and from the ribs, converting it into a cumoid structure which is too weak to stand the strains to which it is exposed. In cases, however, these primary failures may be due to substitution of a pyoid for a holoid structure. For it must not be forgotten that where the bottom, ribs and roof are one and indivisible, the floor is an element of strength and prevents the roof from breaking. Just as the lower flange in a rail helps the ball of the rail to support the weight, so does the floor help sustain the roof so long as the former is unbroken.

One of the patented features of the Luten bridge construction is its holoid structure. Luten does not use this term, but nevertheless the construction is closely analogous to the structure I have been describing. Luten builds not one bridge but two, one for vehicles to pass on and one termed the stream pavement to bind the feet of the piers together so as to form a perfect holoid. Destroy the lower bridge and the upper or traveling bridge is in a precarious condition (see Fig. 15).

The holoid structure gives the strongest of roofs; the pyoid is less strong; the cumoid is still weaker. Every horizontal shear makes the roof progressively less stable. Strange to say, vertical cracks permit the replacement in many cases of a less stable by a more stable structure. The fractures in a vertical direction, which would ordi-



FIGS. 17 AND 18. SHOWING HOW DIFFICULT IT IS TO DESTROY A CONCHOID ROOF STRUCTURE

Fig. 17 shows the large amount of displacement needed to permit the unbroken fall of one leaf of a conchoid, or broken cumoid, 1,000 ft. deep. Fig. 18 shows how the needed distortion is secured by horizontal shears at places of weakness.

narily be thought more detrimental than those in any other direction, prove not unimportant, it is true, yet in a way strengthening.

THE CONCHOID IS THE LAST RESISTANT STRUCTURE

When a cumoid of great depth finds itself inadequate to its own support as a cumoid and begins to rend vertically from the surface downward to its supports and upward from the span centers to the surface, then the cumoid beam becomes an arch, and the cumoid plate becomes a dome and until it fails in its new structural relations, it cannot continue to extend those rents which threatened its stability. Let us say that the cumoid has become a conchoid (from *conchus*, a shell), the lines of stress forming figures resembling one shell of a bivalve.

As the elements of which the roof consists crowd each other into the opening it is impossible for the roof to rupture or fall until the various strata cease to act as a unit and begin to slide past each other (see Fig. 16). If we imagine an element of rock stretching from a rib to the

half span, a distance, let us say, of 100 ft.; if we further suppose the excavated coal or other mineral to be 10 ft. thick, and regard the rib, floor, and falling-rock element to be so adamant that none of the three will crush, heave or bend, then the inclination of the element when one corner reaches to the floor will be 10 per cent.

If the excavation is 1,000 ft. below the surface, the displacement of the block at the surface would have to be 100 ft. (see Fig. 17). At a greater depth the displacement would be more. It is needless to say that such an elbowing of the adjacent rock masses cannot occur even where the crop, broken roof, or the sags in nearby workings make a certain amount of lateral adjustment possible. But horizontal shear along weak planes, such as beds of clay or coal or stratification planes, will permit such a number of readjustments in the element of rock itself that it will be able to come down. It will, in fact, only tend to tilt; it will not actually upset forward as this would involve too many other changes (see Fig. 18).

This, then, is how the end comes unless the rock is too strong to shear horizontally. Subsidence ceases when the required deformation has taken place. The choking up of the falls probably has but little to do with the final result, though it may have its effect in some cases. In fact, the theory as given is comforting to the conservationist, as the beds above the one extracted suffer but little, being exposed only to the horizontal shearing process, which is by no means destructive of the integrity of the measures.

However, the rupture at the half span may often result in falls of moderate size at that point, for when the monolithic roof is weakening by successive horizontal shears, we have a series of superposed cantilever cumoids entirely unequal to the task of self support. If the action which forms these cumoids does not let them all down to the floor suddenly, they will be sure to fracture successively from the bottom upward, and such seams of mineral as partake of this independent action will be destroyed.



Extracts from a Superintendent's Diary

Everyone who reads the daily papers can know that in most coal-mining districts the companies that own the mines also own the houses in which the miners live, as well as the commissaries from which the men buy their supplies; and knowing that, it is so easy to assume that the mining companies come pretty near to owning their employees, body and soul. The fact that in most cases the company has no alternative in the matter of owning its entire camp is never taken into consideration.

I have just gone through an experience which has made me realize that the owning of the houses and commissary by an operating company does not necessarily enable the company's superintendent to regulate the domestic affairs of the employees in an arbitrary manner.

About three weeks ago one of our assistant mine foremen lost his life, probably because of his own carelessness; still he had been attending to his duty and had gone about it in a conscientious way. Under the circumstances every one felt very much distressed by the accident, especially because the unfortunate fellow had always been a faithful worker, loyal to his company and solicitous about the welfare of his subordinates. A week after his death I took the matter up with the company's casualty depart-

ment to see what could be done for his wife and children. It is reported that, according to the evidence, the company's liability would be hard to establish, but it would waive this advantage and permit me to offer the maximum sum allowed by the company for settlement of cases out of court.

I felt sure that the widow would be governed entirely by my advice and so I hesitated about laying the matter before her and finally decided to talk the proposition over with her two brothers, who had come into camp to assist her.

They laughed at my offer and intimated that they would like to see any company beat their sister out of her rights by compromise.

Of course I felt very much put out in having my good offices misconstrued and repaid by insult, but because of my affection for the dead man I overlooked that and decided to await developments.

They were not long in coming.

Yesterday one of the brothers came to my office to inform me incidentally that he was leaving, but he managed to tell me that he had advised his sister to remain in possession of the company house and to trade at the company store until her rights could be decided by the courts, and in the meantime if anyone attempted to oust her from the house, or if the company refused to supply her with goods required from the commissary, she was to go through the camp and impress upon all the inhabitants what a soulless company they were working for.

What an unpleasant predicament.

Undoubtedly the brothers have made the widow believe that it is the company's duty to allow her to remain in the house and supply her from its commissary until the court gives her satisfaction, and if I should attempt to acquaint her with the actual facts in the case she would decide that I was trying to take advantage of her. I would rather pay her house rent and her grocery bill indefinitely than to attempt to persuade her that she ought not to follow her brothers' advice, and yet if I should allow such a precedent to become established my usefulness with the company would soon come to an end.

It's just another instance illustrating the crying need of an adequate and universally accepted liability law.



Speaking as an Inspector of Mines. R. Donald Bain expressed himself in favor of compulsory watering. Referring to an accident in his district (Durham, England), he said that if the regulations as to watering had been carried out there would have been no explosion at all. On this point British mine inspectors are constantly remonstrating. Their remonstrances have had some effect, and there is also a tendency to understand the dangers of dust more than there used to be. "Wet zones" have been proposed and provided, and in the view of Mr. Bain it is possible that if an explosion occurred the area of it would be limited by their action. Most haulage-ways can be watered without interfering very much with the roof and floor, but where there is a great difficulty in watering these haulage-roads and where they can only water here and there it would be desirable that the types of cars used should be such that the dust could not easily escape, and even then the cars should be watered in order to prevent the scattering of dust.



The Tensile Strength and Elongation of Copper Wire varies considerably with its size; annealed soft copper wire ranges in tensile strength from 30,000 lb. per sq.in. in the coarser sizes to 42,000 lb. in the fine sizes. Hard-drawn copper varies in tensile strength from 45,000 lb. to 68,000 lb. per sq. in., according to size. Moreover, a solid unstranded copper wire of larger diameter than 0.46 in. is hard to splice.

The Labor Situation

SYNOPSIS—Under pressure from labor leaders the tridistrict convention makes fewer and less stringent demands on the operators than did the Scranton miners. The check-off will not be demanded in the anthracite field. West Virginia operators will have to pay an increased freight rate of 15c. per ton. The Hocking Valley operators hope to secure concessions which they claim are needed if they would compete with the eastern Ohio field.

On Tuesday, Sept. 7, the miners' representatives of all the districts in the anthracite region, Nos. 1, 7 and 9, opened their tridistrict convention. The meeting was held in Hampton Hall, Wilkes-Barre, Penn., nearly 450 delegates assembling. The expenses of the meeting will be large, each delegate receiving \$3.75 per day. Some have even estimated a total cost of about \$4,000 for each day the session continues.

To guide the convention were the resolutions passed at the meeting of the delegates of district No. 1 in Scranton on July 19 and recorded on page 174 of the issue of "Coal Age" of July 31, but the pressure of the labor leaders, especially of J. P. White, the president caused a slight modification of the demands. These are still unreasonable, but the miners' claims as usual must not be regarded as ultimate; they are purely haggling proposals to be modified later, and they are only made large in order that the miners may be thought reasonable by the public when they surrender some of their demands. "Look," they will say later, "how much we have conceded."

Report of the Anthracite Scale Committee

There were fifteen men in the scale committee, five from each district. Reese L. Morgan was chairman and C. L. Brislin, secretary. The demands were as follows:

(1) The next contract shall be for a period of two years, commencing April 1, 1916, and ending Mar. 31, 1918, and the making of individual agreements and contracts in the mining of coal shall be prohibited.

(2) An increase of 20 per cent. shall be made on all wage rates now being paid in the anthracite coal fields.

(3) An 8-hr. day shall be granted all day labor employed in and around the mines, the present rates to be the basis upon which the advance above demanded shall apply. Time and a half shall be paid for overtime and double time for work on Sundays and holidays.

(4) Full and complete recognition of the United Mine Workers of America of districts Nos. 1, 7 and 9 shall be accorded.

(5) A more simple, speedy and satisfactory method of adjusting grievances than now provided shall be arranged.

(6) Contract miners shall be restricted to one working place.

(7) The selling price of mining supplies shall be fixed on a more equitable and uniform basis.

(8) All coal shall be weighed and payment shall be made for it on a run-of-mine basis, 2,240 lb. constituting a ton.

(9) The machine-mining scale shall be readjusted so that equitable rates and conditions shall be assured.

(10) The arrangement of detailed wage scales and the settlement of internal questions, relative to both prices and conditions, shall be referred to the operators and miners of each district, to be adjusted on an equitable basis.

Comparison with the Scranton Demands

As districts Nos. 7 and 9 do not meet before the tridistrict convention, and consequently have not so far met, it is of interest to compare the conclusions reached by this Wilkes-Barre meeting with those at which district No. 1 arrived in its July session. There is a significant omission in the first demand of the Wilkes-Barre scale committee. The delegates at the Scranton convention declared for "a recognition of our organization with the right . . . to provide a satisfactory method for the collection of its revenues." In short, the demand of No. 1 district was for the "check-off."

For some reason this has been dropped, but the miners apparently did not recognize, at first, that the demand for this privilege had been withdrawn. President White has declared, however, that no attempt will be made to secure it,

as he does not believe it can be obtained and does not want to ask for more than will be granted. It is hard to believe that Mr. White could regard the check-off as any more difficult to obtain than some of those unreasonable demands which he could not induce the committee to remove from the scale demanded. He is surely not unwilling to tack on to his program so important an item for the perpetuation of the union. Only those who doubt the value of the union or its leadership or its right to the adhesion of all miners are opposed to the check-off.

There are, of course, several opposed to the deduction of money from the miner's pay for union dues. These people are dubious about the union and do not believe the miners should be compelled to join it; but surely J. P. White is not among these. It seems natural to suppose that he believes that the check-off, while not popular with the public as is the making of a bargain with the union and the 8-hr. day, will inevitably follow complete recognition and will be won without fighting when the operators have once made a contract with the union as an organization.

Wage Increase of 20 Per Cent. Demanded

The demanded advance in wage in the Wilkes-Barre scale is 20 instead of 25 per cent. The demands propounded by the Scranton convention made quite clear what effect the increase was to have on the pay of day laborers. They were to work 8 hr. for the price of nine and were to receive a further increase of 25 per cent. Their raise in wage was to be 12.5 per cent. per hour and 25 per cent. additional, which figures an increase of 40.625 per cent. per hour. If the addition is to be reduced to 20 per cent., then the increase for each hour is 35 per cent. The meaning of the Wilkes-Barre convention on this matter is by no means clear. It says "the present rates are to be the basis upon which the advance above demanded shall apply." It does not say whether the rate per day or per hour is the rate intended. If the rate per day, the day worker will gain in actual wage per day 7.67 per cent., which is a small gain compared with that of the miner, which is 20 per cent.

In any event the demand, if conceded, cannot fail to raise immensely the cost of producing coal. Mr. White said some time ago that the Delaware, Lackawanna & Western R.R. Co. was making 33c. per day clear profit off each of its men, and that 19c. of this was excessive. Assuming that this profit is typical of anthracite corporations, which it is not, the increase would far more than wipe out the portion of the dividend regarded as unfair, and in fact the entire dividend, even if the lowest interpretation is put on the contract offered by the Wilkes-Barre convention. The miners are evidently looking not to the companies but to the public for their increase. That may be perfectly permissible, but it is not right to declare that the companies can pay it out of present prices.

Still the large concessions demanded of the operators—or should it be the public?—are not satisfactory to the Schuylkill delegates, who believe that in view of the many dangers to which miners are subjected the pay should be larger.

Miners Will Now Discuss Matters with Operators

The committee of miners who will meet the operators is clothed with power to negotiate the best contract possible. This will be submitted for the ratification either of the local unions or, if Mr. White has his way, to a tridistrict convention as in 1912. But the meetings will not be started till about February, when the Indianapolis convention has concluded its sessions.

It is difficult to say who will lead the operating concerns. George F. Baer, when living, undertook that responsibility. It is thought that Col. R. A. Phillips will be selected this year; but it is hardly probable that there will be any recognized leader. Colonel Phillips is hardly a proper selection, as his arguments are weakened by the fact that his company has been more successful than any other in making large dividends. The Philadelphia & Reading Coal and Iron Co.'s president could always sustain a better argument. The miners are trying to drive a salient into the operators' lines through the Delaware, Lackawanna & Western R.R. coal department's weaker defensive position.

It seems probable that if anyone is chosen to express the position of the operators, it will be E. W. Parker. It has always been customary in bituminous fields to select such an officer for negotiations of this sort, though as a rule he has been a recognized labor leader transferred to the operators' ranks for that purpose. A man as disinterested as Mr. Parker is apt to reflect the judgment of all companies concerned.

Many D. L. & W. Employees May Receive Back Pay

The Delaware, Lackawanna & Western R.R. coal department may have to pay \$70,000 to \$100,000 back pay to their inside, outside and assistant foremen, their driver bosses, firebosses, weighmasters, clerks and others. When the miners in 1912 secured their present contract with the operators a wage increase was provided of 10 per cent.

A short while before the contract was signed the salaried men were given a voluntary increase of \$5 a month. They were not given the percentage increase because they were salaried men and the company took the position that they were not parties to the contract. The electricians, electricians' helpers and watchmen at the collieries objected to their being excluded from the increase. The miners took up the claim of these men and the conciliation board considered it. A deadlock ensued, and the case went to Judge George Gray, who decided against the company. The payment under this decision amounted to only about \$5,000, but now all the other bosses are claiming under it.

An inside foreman, for instance, under the old contract got \$120 a month. He now gets \$125, but the award gives him \$132. So he has coming due him \$7 per month for 43 months or \$301 up to Oct. 1. The lower officials will not fare so well, for \$5 more nearly represents the whole amount of the increase they would normally secure. It is only on the part of their salary above \$50 per month that they will obtain an increase if it is paid.

Railroad Rates Are to Be Raised 15c. in West Virginia

The Ohio coal operators have won a substantial victory in their fight against the unfair differential in freight rates that gave the operators in West Virginia a great advantage over them in the coal markets. The fact that the interstate railways in West Virginia, Pennsylvania and Ohio have raised the differential from 25c. a ton to 40c. is the biggest victory which has come to Ohio operators in many years.

Freight rates showing this increased differential will be filed with the Interstate Commerce Commission in Washington at once, and as soon as approved will become effective. The 15c. differential in favor of Ohio coal will be based on the rate to Toledo, and a proportionate differential will be employed for all other markets of the state.

This great boom to Ohio operators came as a result of a conference between the Interstate Commerce Commission and the executives of the coal-carrying roads affected, which was held in Washington during the week. M. J. Caples, vice-president of the Hocking Valley Ry., which is affiliated with the Chesapeake & Ohio Ry., announced the result of this meeting upon his return from the conference.

Coal operators are pleased over the action and predict the early resumption of some of the mines in the Hocking Valley and eastern Ohio districts. It is planned to get the miners back to work as soon as possible, so that they may have the coal ready for shipment when the new rate becomes effective, which should be within 30 days.

Hocking Valley Operators Seek Concessions from Miners

Equally important is the step taken by the Hocking Valley operators themselves. They have brought to the attention of the workers the reasons why, in their judgment, work has been suspended so long. The Hocking Valley operators ask that the same conditions be imposed upon them as are now in successful operation in the eastern Ohio coal fields. They hold that unless this is done the operators in the latter district will gain a stand which will be hard to overcome and may enforce idleness on the southern plants of the state. If the same conditions are adopted by the union men in the Hocking Valley, the operators claim that all the mines will be opened without delay.

They point out these features which are in force in eastern Ohio, but not in the Hocking Valley field: A definite list of holidays which the miners are permitted to observe; a series of regulations that materially aid in the production of clean coal and that provide fines for miners who fail to observe these rules; specified conditions for setting and resetting posts and the rates that may be charged therefor; provision that no strike shall be called for any cause other than a failure to pay wages, and that no mine shall close down on account of a funeral. Frequent holidays and funerals for many years have been the bane of operators.

Military Court of Inquiry in Colorado

A military court of inquiry is investigating the Colorado National Guard. It was originally appointed by the governor to inquire into the charges of corruption in that body and into the efficiency of Adjutant-General John Chase and other high officers in the militia, but its investigations have been

greatly extended. It is endeavoring to discover the motives of those who brought the charges, and it has publicly accused President Wilson and national army officers of aiding the United Mine Workers of America to prevent the rehabilitation of the guard, and it has charged that the Federal investigators in Colorado have worked with agents of the United Mine Workers to the same end.

By order of the governor, Lieut.-Col. E. J. Boughton, president of the military court, and himself one of the officers named in the charges of corruption, has made public a statement that the court has obtained sworn documentary evidence of a conspiracy hatched by agents of the United Mine Workers to hinder the reorganization of the militia and to procure indictments, by misrepresentation, against Governor Carlson, Attorney-General Farrar, high militia officers and leading coal-mine operators and those who have financed them.

Boughton has also charged, on the authority of the governor, that the decision of the state Supreme Court, prohibiting Judge Hillyer from presiding over the trial of three miners involved in the strike, reached Washington 11 days before it was "handed down." This accusation attacks the integrity of the court or of some of its employees, or assumes the commission of a theft, and it is so grave a charge that it will undoubtedly be considered by the Supreme Court at its next sitting.

Union Denies Charges of Illegal Practices

William Diamond, organizer for the United Mine Workers of America, who is said to have succeeded John R. Lawson since the conviction of the latter at Trinidad, frankly admits through local newspaper interviews that the United Mine Workers has had detectives in Colorado gathering evidence on which to base criminal complaints against state officials and coal-mine operators. Only the agitated state of public feeling could distort such activity into an offense, provided the means by which it obtains the evidence it is seeking is wholly within the law.

Mr. Diamond emphatically denies that any of the detectives have worked with any Federal officer, or that the union has any interest in the National Guard other than that furnished by the fact that some of the guardsmen Mr. Diamond would have indicted and others he thinks are able to testify against those who are chargeable with violations of the law. The men the union would indict have so far not been named by Mr. Diamond, but it is believed that the campaign of retaliation is to be directed against John D. Rockefeller, Jr., and other "powers behind the throne."

Union Claims It "Framed" Itself

The United Mine Workers of America denies the force of the evidence obtained by the court of inquiry. It claims that the union officials knew that a raid was to be made on the offices of Major C. D. Elliott, one of the Mine Workers detectives. They accordingly placed a file of false correspondence for the express purpose of misleading the court; but the court in turn declares that this is only a futile effort to discredit the find.

Witnesses before the court have refused to testify, alleging that, the body being military, it has exceeded its authority in summoning civilian witnesses. Among these is Philip S. Van Cise, a former captain in the guard, but now chairman of the committee bringing charges against Adjutant-General John Chase and his lieutenants. Another recalcitrant is Major C. D. Elliott, former adjutant-general of the National Guard of Virginia and now "special agent" for the mine workers.

Van Cise was arrested by the court for refusal to testify. The governor immediately ordered his release pending the opinion of the attorney-general as to the court's jurisdiction in such matters. The latter stated that the court "should have the right" to summon witnesses, civilian or other, though it could not compel those it summoned to give testimony. Several subpoenas and one writ of attachment were issued forthwith. The latter was for the arrest of Major C. D. Elliott, but he had left for West Virginia. There is some talk of attempting to have him extradited.

R. W. Coates, chief of the numerous detectives in the employ of the United Mine Workers of America, has been subpoenaed, but habeas corpus proceedings will be instituted by the union should the court apprehend Coates, Elliott or Van Cise.

Van Cise declares that the charges brought by the committee were made solely in the interests of the state and for the betterment of the National Guard. He wants Chase ousted and a complete reorganization of the body for use in national defense only. He would have a state constabulary appointed to relieve the militia from service in industrial disturbances.

Editorials

Some New Aspects of the Anthracite Trade

The indications are that competition among anthracite shippers is going to be unusually keen this fall and winter. This is being brought about by the fact that many small mining operators who formerly sold their production to the larger mining companies are going into the market direct or changing over to some of the smaller sales companies. These changes have been making themselves felt all summer, and as the busy season comes on a still greater impression will be made.

There can be no denying that the individuals have grown and are equipped to offer both quality and service. They have been making their plans during the dull times and have been catering to the dealers, offering extra favorable prices and extended credits and giving appreciative attention to the smallest order. There is no doubt they have made many new friends.

Their sales forces are large enough to warrant weekly calls on all the trade, and because of this attention the smallest retail dealer has never been in such close touch with the market and in a position to ask more favorable terms.

The dealer who pays a price now without question is a thing of the past, and the feeling that the coal must be inferior on account of low price is also rapidly disappearing, for the very good reason that most coal reaching the market is being better prepared than ever before.

It goes almost without saying, though, that the big companies will make determined efforts to regain lost tonnage and also get new business. For this reason it will be interesting to note developments.

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The Stresses in the Mine Roof

In this issue under the above title an article is reprinted extending the theory of roof demolition. In previous contributions to technical journals and societies the author of that article has kept in mind only the later stages of roof breakage and has overlooked the fact that when a tunnel is driven into a hill the roof is integral with the ribs, and the latter is a unit with the floor. He shows in this most recent publication that it is impossible to treat them apart in the same manner as we would the roof, the walls and the foundations of a house. They must continue to be treated as a whole until in the process of demolition they are parted.

Thus it appears there is a progression in the action of the mine roof which is marked by those renderings which the miner has long since ceased to fear but which are so trying if not terrifying to the tenderfoot.

It may be doubted whether the writer of the article is justified in adding to our already overloaded dictionary and in giving us a new meaning to the old word "pyoid." For holoid, "tunnel structure" would be a satisfactory equivalent; cumoid, could be safely translated into "plate"

and a conchoid would be just as intelligibly described if designated as a "dome."

The idea of a pyoid is harder to convey by ordinary words than any of the others. It is hard to find a name which will not create more fallacious interpretations than true ones, unless we use some other word like "pylon," which is for the mining fraternity as hard to comprehend as pyoid and which is not a perfect analogue even then. Perhaps those who like our mother English as she was before the days of Llyl will prefer to call the pyoid an "n" structure, for after all an "n" is not so far removed in appearance from the actual condition.

However, coined words have their value, because they are supposed to convey only the ideas the coiner places on them. Strict etymologic truth is not demanded in making such names, and once coined they pass as if they were exactly specific, though like copper coins they fail to weigh enough as raw material to justify their recognized evaluation.

■

Unsettled Conditions in the Hard-Coal Business

While the individual anthracite operators market approximately one-third of the production, it is not customary for them to issue a price circular. In this respect they depend on the large companies which for years have issued circulars at regular intervals, and it is these circulars that the individual uses as a basis for his sales. When there is a brisk demand for coal it is not difficult to maintain the circular, but in times of a dull market extraordinary activity of some shippers to get their product to a market has a most disturbing influence on prices.

The one vulnerable spot, which has always been assailed by the individual, is the contract system of selling coal by the large operators. It has been the custom for many years to enter into contracts with extensive users of steam coal, covering their requirements for an entire year. In case the market price should fall below that agreed upon in the contract, the buyer without question receives the benefit of the falling market and when the price rises he is still protected. Furthermore, the buyer is not obligated to purchase the tonnage agreed upon in his contract. Violations of contracts have been especially numerous this year, the consumer buying from the individual at a lower figure than his contract. As a result the large companies have sat idly by and watched a large proportion of their steam tonnage drift away from them, and they now have large stocks of the steam sizes in storage.

It is not to be supposed that the large interests are entirely dormant; as a matter of fact, they have merely been tolerant. It is now rumored that one of the very largest companies has about decided to take a very aggressive stand in the matter of securing and holding their tonnage. It is hardly probable that the method to be pursued will be one of meeting fire with fire, as the big companies are too experienced to engage in a price war.

They could, of course, exert a tremendous power if they determined to right the market by a price-cutting campaign. Naturally, the cry would arise from the small shipper that the large producers were trying to eliminate him.

It is quite likely that aggressive action on the part of any of the larger companies has been delayed simply because of the many false impressions that would spread. Aside from this, the companies have been continually harassed by the Government during the past ten or fifteen years, with the end not yet in sight. Much of this opposition has been traceable to individual interests claiming to have been injured by alleged unfair practices.

If outward appearances count for anything, the individuals have prospered under the present system. Many companies which a few years since were occupying very little office space and had small forces to market their output are branching out by taking large suites of offices and employing new salesmen. It would seem to be wisdom on the part of the individual to realize that with his large aggregate tonnage there is a very great responsibility resting on his shoulders. It is regrettable that with the anthracite business hampered so much from without there should be so much friction from within.

■

The Trend of Conditions on New Contracts

The important contracts under consideration in the coastwise trade the past month have been the Boston & Maine R.R. locomotive supply and the Panama R.R. Co. The Boston & Maine contract (No. 1313, Vol. 8, p. 367) provides for 720,000 tons a year for one-year and five-year terms respectively, either f.o.b. loading port or delivered alongside Mystic Wharf, Boston, deliveries to begin on the expiration of present contracts, in August, 1916, and April, 1917.

At this writing no award has been made, but the conditions of the order are so unusual that they have caused considerable comment. It is recognized that there are only a few shippers, probably not more than three or four, who are likely to undertake business of that size so far ahead. The largest part of this tonnage is now furnished via Norfolk from the Clinch Valley region, and the trade is keen to see whether the present suppliers will be able to hold the order against interests that ship from the Fairmont and adjacent districts via Baltimore. The latter have been securing most of the New Haven business the past year, and the two railroads are of course closely associated.

The bids on the Panama R.R. Co. contract (No. 1327, Vol. 8, pp. 367 and 446) seemed to show the same purpose on the part of Hampton Roads shippers as on previous Government contracts the past year—to keep other coals out of the running. Two bids of \$2.60 f.o.b. Philadelphia on Cambria County coal would have had to be seriously considered had not 400,000 tons of Pocahontas been offered at the same figure at Norfolk.

So low a price would be surprising, in view of admitted prospects for fall and winter trade and a possible labor disturbance in the spring, were it not for the fact that most of the demand is expected to come from the export market, and that those shippers who are credited with heavy tonnages offshore either quoted considerably higher or did not bid at all. Compared with last year's bids on the same contract (Nov. 24, 1914, Vol. 6, pp. 814, 854, 892,

933 and 1048), the low Pocahontas price is 10c. less and that on Cambria coal 8c. less. The Panama R.R. Co. therefore will probably buy its supply at an average price materially less than last season.

In the Philadelphia market the contract trade is extremely dull, the only business offering being 600 tons of anthracite buckwheat, asked for by the Philadelphia County Prison, and the United States Government contract at Wilmington, Del., for supplying 3000 tons of bituminous coal for use in channel work for Philadelphia Harbor. While the prices on the latter contract are not yet available, it can be definitely said that the bituminous interests are not anxious to accept any business at a figure less than the market price.

■

Should Coal Cost More?

Would it benefit the people of the world if the price of coal should be universally raised 50 or 100 per cent.? From one angle it appears as though such a thing should be done.

In the early days of the steam engine the cost of power was enormously high despite the cheapness of fuel. The apparatus in those days was decidedly inefficient, and the first cost of machinery was extremely high. That is one reason why there was so little machinery in use.

With the increase in the cost of coal came more efficient machinery—so much more efficient, in fact, that power became cheaper per kilowatt-hour at the switchboard than it had been before. The very slight increase in the price of coal in recent years is logical enough. Practically all prices of life's necessities have gone higher. And inasmuch as coal is gradually becoming more difficult to mine, its cost should increase.

On the other hand, our scientists are studiously plodding along in their laboratories, cheapening our power for us. Perhaps they are doing as much as they can right now, and perhaps not—who knows? If we should suddenly increase the cost of coal, thus imposing a "peak load" on our scientific friends, wouldn't it stimulate them to such concentrated effort that within a few months they would again bring the cost of power lower than it is today? It looks as though that is exactly what would occur. The scientists need a stimulus. They are a little ahead of the game now, so why should they worry so long as the operator is willing to be the goat?

There is no question but that even now, with our unprecedented knowledge of coal and power, coal is being criminally wasted. Dr. Rudolph Diesel has shown that a thermal efficiency of close to 50 per cent. is a practical possibility with the use of oil as a fuel.

In the early days of his work he proposed injecting a mixture of coal and oil into his engine, but it seems he did not succeed in making a success of such practice.

Perhaps somebody will do it some day, or perhaps somebody will accomplish the same thing in a different way. It may be that in years to come a 50-per cent. thermal efficiency with coal as a fuel will be a common event. In that case we will only burn from 5 to 20 per cent. as much coal as we are now consuming.

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The Oct. 2 issue of *Coal Age* will be devoted to "Safety in Mining" and we invite our readers to send us articles on this subject.

Sociological Department

Valley View First-Aid Meet

SYNOPSIS—The Pennsylvania Coal Co. and the Hillside Coal and Iron Co. held their tenth annual contest on Aug. 28. These companies were pioneers in the holding of such contests in America.

Evidencing a remarkable increase in efficiency, all the 18 teams competing in the tenth annual first-aid contests of the Pennsylvania Coal Co. and the Hillside Coal and Iron Co. at Valley View Park, Inkerman, on Aug. 28, attained general averages of over 91 per cent. in the three-problem contest for the Capt. W. A. May Cup.

A drizzling rain that broke about noon and continued at intervals chilled the spectators and doubtless kept many people away, but despite the weather conditions more than a thousand persons witnessed the contests and showed a lively interest in the demonstrations.

The Pennsylvania and Hillside companies were pioneers in fostering this great work in the United States a full decade ago and have kept up the excellent work by holding the annual intercompany contests. Dr. F. F. Arndt, of Scranton, Penn., has for several years been in charge of the first-aid work of the two companies. During the winter months he instructs the different colliery teams and in the early summer holds district contests, to select the most efficient teams to compete in the intercompany meeting, of which also he has charge.

Year by year, with the extension of the work, the expertness of the men has become more pronounced, and the general efficiency that has been attained in this the tenth year, is so close to perfection that surgeons and first-aid authorities declare that the treatment of accident cases by the companies' first-aid teams leaves little to be desired. With the growth in expertness the tests at the first-aid contests have grown more difficult, and the problems now being given are extremely exacting.

MAY CUP GOES TO NO. 8 SHAFT AND NO. 9 BREAKER

The chief award in the contest was a year's possession of the Capt. W. A. May Cup, the handsome trophy donated by the president of the companies. To secure permanent possession it is necessary for a team to win the trophy three times. A former cup was won for the third time by the Law shaft

to furnish music for dancing, and this year another diversion was an athletic program, with a varied list of events, including some novelties, for the employees and their families. The closing of the mines converted the affair into a general outing, and many families spent the day at the park.

This year the cup contest consisted of three full-team events. Each team was composed of five operators and a subject. Three problems, touching different phases of first-aid work, were given. Making a general average of 98½ per cent., the No. 8 shaft team and the breaker team of No. 9 colliery, North Pittston district, Pennsylvania Coal Co., tied for first position. As the two teams are from the same colliery, the tie was not broken. The remarkable and significant feature is that not a competing team made a lower average than 91½.

The winning teams were composed of the following members:

No. 8 Shaft—James Hopkins, captain; Michael Dunn, Peter Bedford, Richard Lynch, Michael Hoban; Joseph Barrett, subject.

No. 9 Breaker—Thomas E. Ross, captain; Luther Heal, John E. Miller, Max Melcher, Harold Herbert; Floyd Ramage, subject. Of this team, Ross and Heal have both won the individual events in other contests.

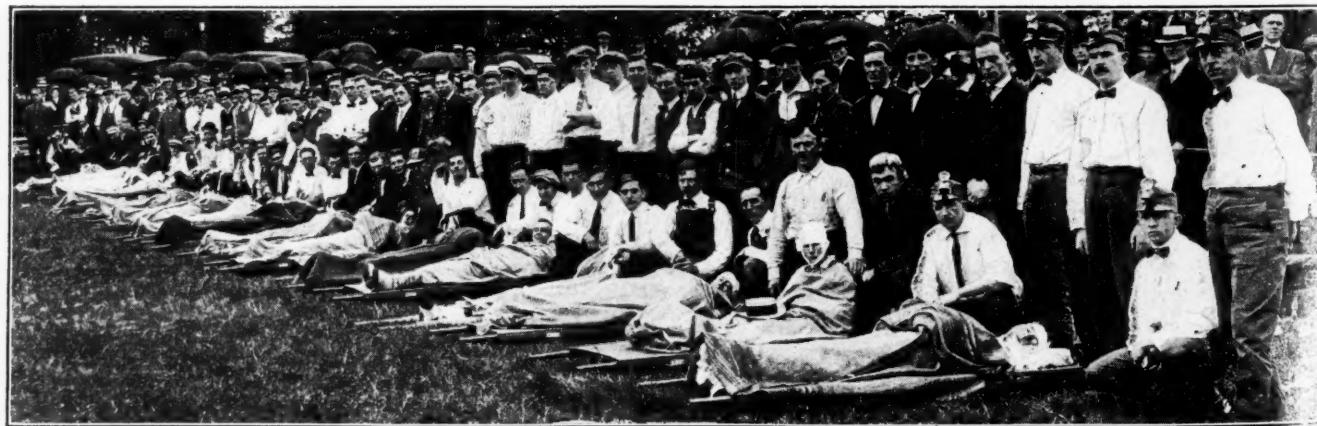
The averages made by the teams follow:

SCORES OF TEAMS IN FIRST-AID CONTEST

	Problem			General Average
	1	2	3	
No. 8 shaft, No. 9 colliery.....	100	100	95	98½
No. 9 breaker.....	95	100	100	98½
Clark slope, Avoca.....	100	96	98	98
No. 2 shaft, Old Forge.....	100	96	95	97
No. 2 shaft, Forest City.....	100	95	95	96½
Checker vein, No. 14 colliery.....	98	93	98	96½
No. 2 shaft, No. 1 colliery.....	100	93	95	96
No. 5 shaft, No. 5 colliery.....	95	95	98	96
Central breaker.....	95	93	100	96
Erie colliery, Mayfield.....	96	93	96	95
No. 6 shaft, No. 6 colliery.....	93	96	95	94½
Underwood colliery.....	93	93	96	94
Courtright slope, No. 14 colliery.....	95	92	95	94
Gray slope, Forest City.....	88	100	94	94
No. 5 shaft, No. 6 colliery.....	90	100	91	93½
No. 1 shaft, No. 9 colliery.....	85	93	96	91½

The problems were divided into three parts, one covering the treatment of wounds and bleeding, another the handling of burns, scalds, sprains and dislocations and the third the splinting and bandaging of fractures, simple and compound.

The individual contest brought together the pick of the experts of the region. The six contestants were given the



THE PENNSYLVANIA COAL CO. AND THE HILLSIDE COAL AND IRON CO. HOLD THEIR HISTORIC MEET THIS YEAR IN THE DRIZZLING RAIN

team of the Avoca district in 1911. The present trophy has not been won twice by any single team.

The company officials have carefully fostered their first-aid work. To increase individual expertness, a one-man or individual contest was instituted in 1913 for the best operators in the different districts. Gold watches and other valuable prizes were given to the winners. A year ago a social atmosphere was lent to the annual event by the presence of a band

following problem to solve: Apply a double-crossed bandage to the jaw of the victim and dress a wound on the front of the chin. Control bleeding in a case where the right arm has been cut off within 2-in. of the summit of the shoulder. Show how to control bleeding where the left arm has been cut off 6 in. above the wrist. Show how to control bleeding where the right foot is cut off at the instep. Bandage the left foot, leg, thigh and left groin.

After the demonstration the judges put the contestants separately through an oral examination on the problem and on first-aid work generally, the oral test ranking equally with the demonstration. A remarkable commentary on the excellence of the work is furnished by the fact that Clement Farrell, of Mayfield, aged 22, made a perfect score in both the physical and oral examination. He was awarded a handsome gold watch.

The other contestants made the following scores: William Creighton, Avoca, 96½; Alexander Tait, North Pittston, 92;



BUT LITTLE OF THE PATIENT'S ANATOMY ESCAPED THE BANDAGE

Harry G. Jones, Forest City, 91; William Tewksbury, Dunmore, 85½; Peter Hoolihan, South Pittston, 80½.

The officials of the meet were: Director, Dr. F. F. Arndt; timer, Edgar C. Weichel; recorder, F. D. Conover; judges, Dr. F. J. Bishop, Dr. W. E. Keller and Dr. W. G. Fulton. The committee consisted of C. H. Frederick, chairman; W. P. Jennings, H. T. McMillan, F. H. Wright, J. P. Jennings and F. H. Coughlin.

The crowd thronged the athletic field to witness the athletic contests. The Pennsylvania Coal Co. won the tug-of-war in which the foremen and assistant foremen of the two companies were pitted against each other, and the strongest employees of the two companies tugged manfully. Other results were: Putting the shot, William McGuire, 36 ft. 10 in.; pipe race, Michael Hoban; fat man's race, George Parry; boys' race, tie between Frederick Llewellyn and Jacob Nagle; standing broad jump, Chester Adams, 9 ft. 2 in.; three-legged race, Max Nelson and John Tischler, first; egg race for ladies, Mrs. John Huffsmith; boys' race under 17, Victor Valerious; 220-yd. dash, Chester Adams.

O. W. Wintermute, physical director of the Pittston Young Men's Christian Association, directed the athletic events.

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Old Company's Annual Meet

SYNOPSIS—The Lehigh Coal and Navigation Co.'s meet covered not only first-aid but land and water sports. A sparring match with heavily padded gloves was an interesting feature. The different districts competed for supremacy in aquatics and athletics and for the possession of a champion trophy, just as they competed there and have in other places for leadership in first-aid and for the ownership of a cup.

The third annual outing and first-aid contest of the coal-mining department of the Lehigh Coal and Navigation Co. occurred at Lakeside, about 6 mi. from Tamaqua, Penn., on Saturday, Aug. 28, and notwithstanding the efforts of the Weather Bureau to dampen the ardor of the contestants and spectators, a series of contests in first-aid and sports was held which will long be remembered as the most successful and enjoyable ever arranged by the company.

A special train starting from Lansford at 8 a.m. gathered up the participants from the Panther Valley, approximately 750 altogether, and reached Lakeside at 9 a.m. Immediately on leaving the train the participants, led by an excellent brass band composed of Slavic employees of the company, formed a line of march to the field where the first-aid contests were to be held, and no time was lost in getting to work.

In the first-aid contests 27 teams participated. For some time previous these corps had had special training in 20 different problems, from which five were chosen by lot just before the contests began, and the teams were not advised as to the problems to be presented until they were announced by megaphone as each event was to be contested. The problems drawn for the contest were:

One-Man Event—Dress a simple fracture of the lower jaw and a gash on the left leg over the knee. Time, 4 min.

Two-Man Event—Dress frostbites of both ears and both hands. Time, 4 min. This problem was introduced for the first time into a first-aid mine contest.

Full-Team Events—Dress a compound fracture of the right thigh and laceration of the scalp on a line from the forehead to the base of the skull. Time, 8 min.

Dress a compound fracture of the left leg and a simple fracture of the right collar-bone. Time, 8 min.

Treat conditions of man overcome by gas, with burns on head, neck, upper chest, forearms and hands. Give artificial respiration for 1 min. Treat for shock. Dress burns. Time, 8 min.

In these and in the 4-min. events several of the teams completed the treatment of the subject in about half the time allowed. The celerity with which the work was performed, as well as the perfection of the job itself, testified to the enthusiasm of the men and the excellence of their training.

The three winning teams were (1) the outside employees of Lansford district, Alexander Gibson, captain, with a score of 98.4 out of a possible 100, the special prize being \$25 in gold to the team and a silver medal with his name engraved thereon to each of its individual members; (2) employees at Nesquehoning shaft, Fred Heffler, captain, with a score of 97.6 points, the prize being \$15 in gold; (3) employees of the electrical department, Thomas F. Whildin, captain, with a score of 97.4 points, the prize being \$10 in gold.

In the 1914 contest the first prize was won by the outside employees at Nesquehoning, the second by the electrical department and the third by the Lansford shops.

Of the 27 teams competing for the prizes, 6 were from the Nesquehoning district, 5 from Lansford, 5 from Coaldale and 7 from Greenwood. These district groups of teams also competed for a cup trophy presented by the company, the prize being awarded to the district having the best general average in the first-aid contests. The Hauto washery, Lansford shops and electrical-department teams are excluded from this competition. The cup is held for one year by the district winning it until one district has won it three times, when it becomes the property of that district. Coaldale district, with a general average of 95.3, wins the cup for 1915, Lansford and Nesquehoning being nearly tied for second place with 93.8 and 93.6, respectively.

WATER SPORTS IN THE PARK LAKE

Immediately after the completion of the first-aid contests the spectators and contestants moved to the lake shore, where, after a sandwich luncheon, the water sports began. These consisted of two swimming and two rowing contests, in which the four districts competed. Both swimming contests were won by William Barry, of Greenwood district. The single-oar boat race was won by H. Houser, of Coaldale district, and the double-oar race by W. Miller and L. Hiles, of Nesquehoning district.

After the water sports were finished and before the field sports began, a bountiful and excellent dinner, under the direction of Edward Petzel, steward of the Old Company's Club at Lansford, was served in the grove, and though most of the guests not provided with raincoats or umbrellas were by this time fairly wet to the skin, there was little lacking in enthusiasm or appetite, and ample justice was done to the feast. Steward Petzel says he never saw a hungrier lot of "boys."

BOXING CONTEST FOR POINTS

An unusual and particularly appreciated event introduced at this outing as a diversion just preceding the field sports was a boxing contest with soft gloves. This consisted of three bouts, two of a preliminary character, between representatives of the four districts, and a final bout of six rounds, in which the winner was given a prize of \$20 in gold and the loser a consolation prize of \$10. The boxing contests provoked as much enthusiasm as any of the events, though no points were given to the winner on the general sports' score.

Up to this time the weather conditions had been about as unpropitious as they could be. The sky had been overcast from the early morning and a chill easterly wind had brought rain just as the march to the first-aid trials began. Fortunately, however, the rain, though chill, particularly to the "patients," whose attire was necessarily scanty, was not heavy enough at any one time to interfere with the program.

or to send the spectators to cover. During the afternoon when the field sports were being held the weather conditions were more favorable, the rain clouds withdrawing for a time as though showing more sympathy with the athletic than with the first-aid contests.

ATHLETIC CONTESTS COMPLETED MEET

The field sports consisted of running races, standing and running jumps, potato races, putting the shot and the tug-of-war. The winners of first place in both field and water sports were given 6 points. Those who won second place were credited with 4 points, those securing third place were awarded 2½ points, while those placed fourth were given only 1 point. In the tug-of-war, however, the winning team was given 10 points. The trophy for the field sports is also a silver cup, and the same rule obtains as to its awarding as governs that offered for competition in the first-aid contests. The winner this year was Greenwood, with a total of 54 points, the decision resting upon the result of the tug-of-war, with its 10 points, which was won by the Greenwood district. The points made by the other districts were, in order: Lansford, 47.5; Nesquehoning, 35.5; Coaldale, 17.

The individual winners in these events were as follows: 50-yd. dash for 50-yr.-old men, won by A. Haughton, of Lansford district, time 7 sec.; 100-yd. dash, won by George Jones, of Nesquehoning, time 10 sec.; 220-yd. dash, won by same; standing jump, won by Joe Leckitas, of Greenwood district, 9.65 ft.; running jump, won by William Richards, of Lansford district, 18.8 ft.; potato race, won by William Richards; putting 16-lb. shot, won by William Brennan, of Lansford district, 30.7 ft.

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Wentz Allied Companies' Meet

The Wentz Allied Companies include the Midvalley Coal Co., at Wilburton, Penn.; J. S. Wentz & Co., at Hazle Brook, Penn., Upper Lehigh Coal Co. at Upper Lehigh, Penn., and the Maryd Coal Co., at a town of the same name, also in Pennsylvania.

These corporations held their second annual first-aid meet and field meet at Hazle Park, Hazleton, on Friday, Aug. 27. The weather was not by any means propitious but though conditions were threatening, the program was not revised.

Twelve teams of adults competed for the prizes, which were a silver trophy cup for the leading team and \$25 in gold for the second team. The breaker boys, who had three teams in the meet, competed for a prize of \$5 in gold. The Upper Lehigh teams were successful in landing the cup and money prizes, the first going to the No. 2 team and the second to the No. 1 team of that colliery. The management of the companies was so well pleased with the showing of the breaker-boy teams that they were all given a prize of \$5 in gold. The problems were as follows:

One-Man Event—Leg crushed off below knee; stop bleeding and dress stump.

Two-Man Event—A man has his arm caught in a machine, by which it is torn off completely and pulled out of the socket at the shoulder joint. Control hemorrhage and dress the wound. State to the judges what was your first method and what your final method of stopping the flow of blood; state also your final disposition of the injured man. Time, 10 min.

Three-Man Event—Right ankle dislocated, compound fracture of the lower third of the same leg, with arterial bleeding. Time, 10 min.

Four-Man Event—A man, overcome by heat, falls and fractures his skull. Resuscitate and dress fracture. Time, 6 min.

Full-Team Events—(1) Dislocation of the spine. Simple fracture of the left arm and forearm. Time, 15 min. (2) A miner is caught by flying coal from a shot which was supposed to have missed fire. The right side of his face is badly cut, his right eye is blown out, he sustains a simple fracture of the right thigh, and three of his lower ribs on the left side are broken. Time, 18 min.

Triangular bandages were used in solving all problems as stipulated in the rules. The contest was close, the teams being all of about equal ability. The judges were strict in their oral examination of the captains, and each team was closely questioned as to the method pursued in treating the various injuries.

The judges were: Dr. Biddle, of Fountain Springs; Dr. J. M. Maurer, of Shamokin, surgeon of the Susquehanna Coal Co. in that territory; Dr. D. H. Lake, of Kingston, surgeon of the Delaware, Lackawanna & Western R.R. Co.'s collieries; Dr. Robert Gaughan, assistant surgeon at the Hazleton State Hospital. Dr. Montelius, of Mt. Carmel, was starter. Messrs. Ward and Kotch of the companies were the scorers.

After the contest the men and invited guests, totaling in all 400 persons, were invited by the company to a dinner spread under the trees in the park. After dinner a baseball game and shooting match completed the entertainment.

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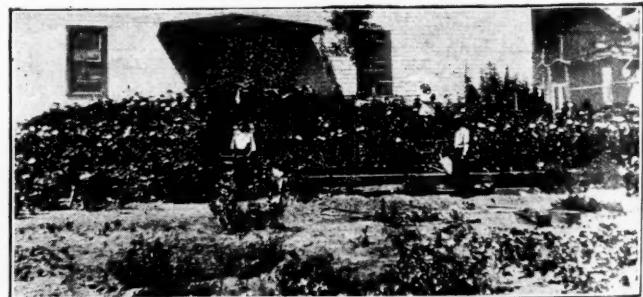
Victor-American Fuel Co.'s Garden Contest

By C. S. TAYLOR*

The Colorado division of the Victor-American Fuel Co. held its third annual contest for lawns, flower gardens and vegetable patches the latter part of July of this year.

In every mining town where the company has interests and where sufficient water is available for irrigation three cash prizes are awarded, consisting of \$25, \$15 and \$10 each.

*2044 Ash St., Denver, Colo.



THE JAPANESE BOARDING HOUSE AT DELAGUA HAD A GORGEOUS DISPLAY AND TOOK FIRST PRIZE



FRONT AND BACK YARDS AT CHANDLER, COLO., FROM THE DOCTOR'S RESIDENCE

On left, view in front of brickhouses, and on right, scene in rear of doctor's office and of adjacent lot. Wherever the land is not watered thoroughly trees and plants will not grow.



for the best yards, whether they are planted to grass, flowers or vegetables.

The only conditions imposed are that there be three or more contestants in each town, and that those participating in the contest be bona-fide residents of the place and employees of the Victor-American Fuel Co.

The mine superintendent, surgeon and clerk are excluded from participation in the awards, although these three individuals have always received a liberal amount of praise from



AUGUST HUTTER RECEIVED FIRST PRIZE AT CHANDLER FOR HIS PRETTY GARDEN

the judges in making their rounds. Disinterested parties residing in some neighboring town are selected for the judicatory board.

Each year an improvement is noticeable over the work of previous years. More are participating each year and the standard is raised as time passes.

The following awards were made:

Delagua—First prize, \$25, J. M. Kawahata, Japanese Hotel; second prize, \$15, John Ban; third prize, \$10, Carr Robson. Judges: Charles Epstein and A. A. Bennett.

Hastings—First prize, \$25, Mrs. Elizabeth Roberts; second prize, \$15, W. S. Krause; third prize, \$10, W. M. Cunningham. Judges: Charles Epstein and A. A. Bennett.

Chandler—First prize, \$25, August Hutter; second prize, \$15, Joseph Charis; third prize, \$10, C. H. Smith. Judges: John Shaw, Hunter Palmer and H. Galley.

Ravenwood—First prize, \$25, William Smith; second prize, \$25, divided among B. Pastoria, John Happa and Joe Watson. Judge: S. M. Andrews.

At Ravenwood there were three contestants who had exactly the same percentage, so it was decided to amalgamate second and third prizes of \$15 and \$10 respectively, giving each of the three contestants an equal share.

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Contest at Knoxville, Iowa

By H. C. AUSTIN*

SYNOPSIS—First-aid work makes slow but sure progress in Iowa, and is being steadily fostered by the labor unions. The meet at Knoxville in Marion County was attended by only three teams.

Compared with her sister states, Iowa in general may seem to lack enthusiasm in first-aid work. Yet the Des Moines first-aid contest and several minor events since may fairly be deemed to show that a campaign has been started in that state which can hardly fail to be successful, should the contests in the future interest both the mining fraternity and those in other walks of life as did the contest held at Knoxville.

This event was held as an additional attraction at the Labor Day celebration of that town. The contest was inaugurated more for its educational value to the community than for any other purpose, and it served its purpose well, judging from the remarks and comments made by the spectators. The majority stopped to see what was going on purely from curiosity, but stayed to the end of the contest intensely interested and amazed to see the work done by the first-aid teams.

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The contest was under the general supervision of Sam Ballantyne, vice-president of District No. 13 of the United Mine Workers of America, who with great skill "ran off" the meet without a "hitch" in the proceedings.

A MINING COUNTY WITHOUT A FIRST-AID TEAM

Knoxville is the administrative seat of Marion County; but while there are several important operating mines in that political division none of them has a first-aid team, so all the contestants came from other counties in the state. The personnel of the teams was as follows:

The Seavers Team of the Colfax Consolidated Coal Co. from Seavers, Iowa—Noah Barker, captain; Evan James, Russell Williams, Frank Willey and Fred Dickey. The Buxton Team of the Consolidated Coal Co., Buxton, Iowa—G. D. Yancy, captain; Allen Staten, James Gillette, G. W. Broots, William Phillips and Fred Coleman. The Hocking Team of the Hocking Coal Co., Hocking, Iowa—J. G. Henwood, captain; Clyde McDonald, John Wilson, William Chemington, Sam Oudrens and Ed Thorpe.

The last-mentioned team took first prize in the Des Moines meet this spring and also contested at the Kansas City meet of recent date, where only by reason of a misunderstanding they failed to be awarded the trip to the Panama-Pacific International Exposition.

NONE BUT FULL-TEAM EVENTS WERE CONTESTED

Three problems were worked out, which were selected by Mr. Ballantyne from a list of five, all of them being full-team events. They were as follows:

Man found with broken back. Prepare patient for removal and stand in an upright position. Time, 12 min.

Miner caught between loaded cars. Rib and right shoulder blade broken; left arm broken 3 in. below elbow; left foot crushed; cut on right cheek. Improvise stretcher and carry 50 ft. Time, 12 min.

Simple fracture of right thigh; fifth and sixth ribs on left side broken; compound fracture of right wrist; bright-red blood issuing. Improvise stretcher and carry patient 50 ft. Time, 11 min.

The first event was the most closely contested, all the teams averaging above 90, as follows: Seavers team, 96 per cent.; Buxton team, 94, and Hocking team, 91.

The second event seemed to give the most trouble, the difficulty being not so much in technique as in minor matters. The Buxton team bandaged the wrong arm. The Hocking team seemed to be somewhat nervous in that event and was penalized for not having sufficient material on hand, also for awkwardness, slowness and the faulty directions of the captain.

However, that team made up for these lapses in the last event, in which it made a perfect score. The Buxton team again fell down rather badly, suffering a 13-point penalty. The Seavers team was deliberate, methodical and consistent throughout, only losing 16 points in the three events, the final score being as follows: Seavers, 94%; Hocking, 93%; Buxton, 86%.

Drs. Connell, Ames and Wright, all of Knoxville, were the judges. Dr. A. E. Reiter and H. C. Austin were score-keepers and Senator Clarkson, of Albia, acted as timekeeper.

The contest was witnessed by approximately a thousand people. The crowd as a whole, was either bent on pleasure, or had not felt hitherto any interest in work of this character, but that so many turned aside to view the contest shows that the exhibit did much to advance the progress of first-aid in Iowa.

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Montana Hoisting Engineers—Employment of operators of electric and air hoisting engines used in lowering or hoisting men is regulated by a law adopted at the recent session of the Montana legislature. Section 1 makes it unlawful for an unlicensed person to operate such an engine of more than 25 hp., subject to the same exception in emergencies that is made by the revised codes of the state concerning the employment of unlicensed operators of steam engines and boilers. Sections 2 and 3 provide for issuance and revocation of licenses by the state boiler inspector and authorize persons who hold first-class licenses for operation of steam engines and boilers to operate electric and air hoists without the license prescribed by the new law. Section 4 divides the licenses into two classes, the first being limited to applicants who have had three years' experience or more in operating electric or air hoists and authorizing operation of any such hoist and the second class being limited to applicants with at least two years' experience and forbidding operation of a hoisting engine of more than 100 hp. Section 7 makes it a misdemeanor for an unlicensed person to operate any of the machinery covered by the act or for an owner or manager to employ any such unlicensed person.

Discussion by Readers

Responsibility of Miners

Letter No. 1—In my experience of 25 years in coal and metal mining, during which time I have endeavored to make a close study of mining conditions, I do not recall anything that has so aroused to action all mine operators and officials as the great "Safety-First" movement has done. There can be no question but that the measures adopted by these operators and officials have warded off many accidents and saved lives. But what has been done in this direction only leads one to ask, Why have these efforts put forth so earnestly not accomplished more than they have? The problem is not easily solved, but there are three reasons that, when well considered, speak volumes. I will refer to these separately and briefly.

First, the newspaper press and many news agencies seem to take special delight in assailing the great coal companies of our country, with the result that they have educated the average miner to believe that these companies are directly and wholly responsible for the safety of their employees in the mine. This idea has taken so large a possession of the minds of the general miner that he has come to feel no personal responsibility for his own safety while in the mine. He believes that it is the company's place and duty to take care of him. Many a time the miner knows what he should do for his own safety and yet puts off doing the work until he is instructed to do it by the mine foreman or his assistant.

On this account, while mine officials have made great advances in the direction of safety, miners as a class have retrograded along this line. Not many years ago little attention was given by the operator to the question of making the mine safe, but his chief thought and effort were devoted to increasing his profit. The safety of his employees was not a matter of his concern. Today the first consideration in all up-to-date mines is the safety of the men employed. Formerly the miner had to work single handed for his own safety. Now, how much more could be accomplished if the miner would coöperate with his employer in matters of safety and realize his own personal responsibility in this matter? The miner must remember that no one but himself can exercise the constant vigilance and care needed to avoid the unseen and often unexpected dangers that surround him while at work.

Second, the present-day tendency of the miner is to shorten his hours of work and increase his daily output of coal. In his haste to do this and load his turn of cars, he gives little attention to the safety of his surroundings and neglects or postpones to do what his better judgment would tell him is necessary in order to make his place safe. This rush to load coal not only affects the miner but urges the drivers to the same recklessness and disregard of safety in their efforts to supply the turn of cars.

Third, few will deny that there is prominent in many mining towns a spirit of recklessness. There can be no question but that this spirit is destructive of all that

pertains to personal safety and the security of property. I believe that much depends on the earnest efforts of coal companies to repress this spirit of reckless bearing among its employees. I believe that this should be made a feature of the work in the safety movement. Much could be accomplished in this regard if a certain portion of the money spent for increased safety could be devoted to the development of the church life and work in the community in mining towns. In the associations of the church, men are led to regard life as sacred and are impressed with a seriousness in regard to death. This leads them to a fuller realization of danger and the exercise of greater care and caution in their daily work.

These three causes, as I have said before, speak volumes and furnish much food for thought. They deserve careful consideration in our efforts to make mines safer.

C. W. ROTENBERRY, Supt.,
Stonega Coal & Coke Co.

Arno, Va.

Labor in Mining

Letter No. 9—Referring to the article of Josiah Keely, *Coal Age*, Aug. 21, p. 294, in which he discusses the question, "Why are strikes at coal mines of such frequent occurrence?" I desire to offer a few comments, which should not be regarded as criticising any of Mr. Keely's statements, but merely expressing my own opinion on this subject.

It would seem that Mr. Keely's statements refer mostly to conditions in our own state of West Virginia. There are, no doubt, many reasons for the present unrest; but, in my opinion, the chief reason is the enmity that has existed for a number of years between employers and their employees. The feeling may not be as strong today as formerly, but it cannot be said to be eliminated. Up to a few years ago, as is well known, certain coal operators had the upper hand in their own counties and in the state. In one instance an operator was styled "king" of the county, where he not only ruled the mines with an iron hand but controlled the whole political machine, which he had built up in that county. His ruling days came to an end, however; but in leaving he could not take with him the hatred he had generated in the miners.

I am happy to say that conditions are not the same today, though all mining districts in the state are not alike. There are fields that always had more or less trouble before they were unionized, but the trouble increased when they became organized as a union. There are other fields where no union exists, and trouble is almost a stranger, although it cannot be said that the working and living conditions are quite so good there as in the other fields. The reason for this is that the mines are smaller operations and the owners come into closer touch with their men, whom they strive to treat fairly, as far as their limited means permit.

The miners working in these smaller operations have not been oppressed as those in the larger fields, where

the owners of the mines are hardly known. The mines in those fields were largely in charge of a superintendent, who had nothing at stake but his position and was determined to be boss as long as he lasted. He often overstepped his rights, not only in the mines and during working hours, but in the social life of the camp. I do not mean to say that there were not some good officials among them, but they were in the minority. Neither do I mean to suggest that a mine official can be given too much power as long as he uses it with discretion.

It often happens that a superintendent who has made good in one field, on changing to another field, discovers that he must change his ways of dealing with the men. A superintendent will often misjudge his man, as in one case, when that official remarked, "Mike is a good loader; there is none better in the mine; but he wants to be jollied along." Now, I will say that if Mike comes out and asks for more props he doesn't want to be "jollied," he wants props. He may not say much when he gets a jolling instead of the props; but as the Irishman said of his parrot, "He don't talk much, but he is a bugger to think." Mike will take the jolling for a time, but some day he will explode, and the explosion will bring out of the mine all the other Mikes. Then the management wonders and asks, "Why are strikes at coal mines of such frequent occurrence?"

I have referred to the prop question only as an illustration. It is a trivial matter that is easily adjusted if attended to in time; but there are other trivial matters that are too often "jollied" down instead of being met fairly and squarely, and satisfaction given before they become real grievances.

Every mine official should be able to command the respect of his subordinates, and likewise the respect of every worker in the mine. But in order to do this he must be thoughtful and study the situation as it is. Should the field be unionized, he should try not to allow his mind to become prejudiced against such a condition, but endeavor to establish good terms between himself and the union. In that case, should trouble arise, the miners will surely see him before throwing down their tools and going out on a strike.

In every case, miners should be made to feel that they will be given justice. Should they be in the wrong, the superintendent should talk over the matter with them as man to man. It may happen that there are some black sheep, but the effort must be made to overbalance their influence among the men. The superintendent must remember that miners have the same right to organize as the operators in whose mines they are employed.

Operators, not only in West Virginia but everywhere else, would do well to study the system of one of the largest coal companies in the state of Wyoming. The management has to contend with Greeks and Japs, in addition to all the other nationalities that frequent our coal fields. The field is organized and it is doubtful whether the company would desire to return to the open-shop system. They encourage the union in every possible way, with the result that most of the men are satisfied and contented. They see to it that their committees are composed of the most liberal-minded men in the camp.

Now observe how, under these conditions, troubles in the mine work out in a reasonable way. Suppose, for instance, a motorman, timberman or trackman, so mind-

ed, aims to do as little work as possible for the time he puts in. There is surely a miner who is inconvenienced in his working place because of this man's shiftless ways, and the fellow is soon reported to a mine committee, which promptly takes up the matter with the guilty one and gives him a chance to mend his ways or submit to having his case called to the attention of the foreman or superintendent. The union motto in that camp seems to be, "A fair day's work for a fair day's pay." It is understood that every man must work so as to do justice to the company, the union and himself. That kind of union almost eliminates the type of man who insists on getting daywork inside of the mine, where he can lose an hour in the morning and be hunting for it the rest of the day.

It is good to notice, however, that there are many signs which show that West Virginia is coming to the front, her natural place in coal mining. The violence that has dominated the early union is fast being replaced by the order that characterizes the modern union. False leaders and agitators are beginning to find that the rank and file of the miners will not be led to repudiate their contracts and indulge in violence and disorder.

C. J. FUETTER.

Logan, W. Va.

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Efficient Mine Foremen

Letter No. 3—Let me first ask the question, What is a mine foreman? I would answer: A mine foreman is the man who is held responsible for everything that happens in the mine, which may mean the loss of a life, or the cost per ton of coal produced, or anything that may come between these two items. He is the man whom the mining department holds responsible for the carrying out of the mining law under penalty of imprisonment or fine. The mine superintendent expects him to deliver the coal to the tipple at the very lowest cost. The employees expect him to adjust all their grievances, whether real or imaginary. If he fails to do this to their entire satisfaction he is at once pounced on by the officials of the miners' union. Again, he is never sure of the position he holds. At any time the superintendent or the operating company may become dissatisfied with him and, as a result, he must go. There is no one to whom he may appeal, and he finds himself, on very short notice, without work. Hence, we can see that this is not the best of positions to occupy.

Let us now see what a man must be before he can prove efficient as a mine foreman. He must be a man who is strictly sober and also honest, one that will refuse to take a gift however small from any of the workmen. He must be a man that has the confidence of all who work under him, one that can keep cool in any emergency and teach others to do the same. He must be energetic in his studies and keep up with the ever-changing conditions of mining. He must understand the theory as well as the practice of mining. It will be better for him if he has worked up from a trapper boy or driver.

He must be able to render first-aid treatment to an injured man, no matter how serious an accident may occur. He should be a man who can pass an examination, proving to the state mining department that he understands all the state laws of mining; can work out various problems in ventilation; knows the properties of the vari-

ous gases met with in coal mining; is able to attend to the drainage of the mine and has a good practical knowledge of electricity. He must at all times carefully watch the ventilation of the mine and measure the air current as prescribed by law. If he finds it sluggish, he should at once ascertain the cause, which will probably prove to be a fall in the air course, a broken-down stopping or an open door, and proceed at once to remedy the trouble.

In mines generating firedamp the foreman must see that all persons are out of the mine before permitting the fan to be slowed down or stopped for repairs. His motto should always be (1) the safety of everyone under his care, (2) the safety of the company's property, (3) cost of operation. Some companies appear to have reversed these items. He must be a man who has the force of his own convictions, be able to say "No" and strictly adhere to his decisions, having first made sure that he was right. He must, as nearly as possible, carry out the mining law to the letter. He must be a man of original ideas, but never feel himself too big to take advice, even if it comes from a coal digger.

To review more fully some of these qualifications, it may seem strange to many readers of *Coal Age*, but there are mine foremen who have few of the qualities mentioned. Such a man holds his job simply because he can get out the coal at a reasonable cost by bullying the motormen or the drivers, as the case may be. He does this more readily if they are foreigners. His other responsibilities are taken care of by his assistants. This can only happen in a state where the mine foremen do not have to pass an examination.

Again, there are mine foremen who are quite up to the standard and have all the above-named qualifications. A man who is strictly sober is most likely to succeed, because he can keep clear of the traps that are set by the wary miner for the mine foreman who takes a drink once in a while. It is a well-known fact that when a miner gives anything to the boss he always expects a great deal more in return. There are various ways to gain the confidence of the men. Treat them as you would like to be treated yourself; help them in any way you can. This may mean assisting a man to put a car on the track, lending a hand to put up a cross-timber, helping a man to charge a hole, or helping to do any other little thing that a mine foreman may come across during his daily examination of the working places. These acts are not much in themselves, but they go a long way toward gaining the confidence of the men. First-aid should be understood and practiced by every mine official, both inside and out of the mine. How ridiculous a mine foreman looks when an accident occurs and he is not able to give the proper aid.

Some superintendents appear to like the idea of cutting down the mine foreman's order for supplies each month. In that case the efficiency of the foreman is greatly curtailed. No sensible-minded man will pass in an order for supplies that he does not need. Recovery of rails, ties and posts from abandoned workings is done by careful foremen as soon as the workings are finished. If this is not done the material is lost altogether or recovered later only at an unnecessary expense to the company. In conclusion, the foreman must work hand in hand with his men, the mining department and his superintendent if he would prove himself to be an efficient mine foreman.

—, Ohio.

MINE BOSS.

Stopping Payroll Leaks

Letter No. 7—I was much interested in reading the several letters in regard to stopping payroll leaks. The last one, *Letter No. 7*, by C. J. Fuetter, *Coal Age*, Aug. 7, p. 227, impressed me particularly.

In this letter Mr. Fuetter points out the loss that occurs when the bonding of the rails in an electric haulage system underground is left in charge of a mine foreman who gives the matter no thought or care. The reason is often because the mine foreman desires to make a record for himself by cutting down his cost-sheet, not caring, as Mr. Fuetter suggests, that he is thereby creating a much heavier expense in the powerhouse, the blame for which he knows quite well will be laid to another man's charge and he will escape.

It stands to reason that the greatest success can be obtained in mining operations, only when every man works in the company's interest and considers that above everything else. It is up to the operator to discover the foreman who is trying to make a record for himself by piling up expense on someone else. Such a foreman will always leave the mine in a worse condition than he found it when he assumed charge. While we cannot expect every mine foreman to be a mining engineer or an electrician, we may expect mine operators and superintendents to see that the work is so divided among the different department heads that it will be performed intelligently and with the least expense of time, labor and money. Such a division of the work would require that all electrical equipment shall be under the supervision of a competent electrician. In other words, the entire work of the mine should be classified and put in charge of those who understand its performance.

The suggestion that friction would result from the electrician having charge of rail-bonding underground, because of a supposed conflict of authority between him and the mine foreman, will not apply if both of these men understand that the success of one means the success of all and that the failure of one means the failure of all. If this is true the only thing that remains to be done is to coöperate, each man working to the advantage of the other. By so doing he serves the best interest of the company and, incidentally, advances his own interest by reducing the general expense and making the work of mining more successful.

There is perhaps no one feature that increases the expense of operation to a greater extent than the lack of harmony and coöperation on the part of employees, especially the heads of different departments of the work. It often happens that jealousy arises between two department heads, and as a result they pull against each other and strive continually to find ways in which they can work to the other's disadvantage. At times we find a superintendent who encourages this spirit, calling it "competition." In my opinion, it is not competition, but should be regarded as a "trouble breeder." In the end it will bring disaster to the hopes and ambitions of one or both of the parties concerned. A jealous spirit breeds discontent. To illustrate, I want to recite briefly one instance that came under my observation:

At a certain mine, the inside foreman in charge had worked up from a driver to his present position. In the same company, the store manager came from a business college where he obtained his education. The trouble

began when Mrs. Store Manager discovered that Mrs. Foreman was born and reared in a mining camp, and promptly cut her acquaintance, with the result that Mr. Store Manager soon discovered that Mr. Foreman had formerly driven a mule and, indeed, dug coal for a living. The gap thus opened widened rapidly, and the store manager found opportunity to disparage the work of the foreman by making some of the miners believe that the foreman had reported short time for them. The foreman retaliated in short order by stopping certain of the men from going into the mine, because they had been detained at the store when buying their oil and were a few minutes behind the time for starting work. To make a long story short, both men lost their positions, as a result of their personal controversy. Both of these men were well fitted for the positions they occupied, but they did not coöperate, and instead of creating harmony they preferred discord. In their efforts to discredit each other they delayed the work and injured themselves. One of the principles of all successful business is the harmony and mutual good-will of everyone concerned. What is the good for one is the good for all.

Before closing I want to mention one other point where loss to the company results. I refer now to waste of material taken into the mine. A dozen cross-bars

are sent into the mine, and part of them are used, while the remaining two or three are thrown to the side of the road and forgotten or covered with refuse and lost. When more timber is needed another lot is ordered from the surface. Frequently, longer timber is sent down than is ordered or can be used. The miner saws off the ends of the sticks and throws them back in the waste when these could often be split up for cap pieces. The same waste occurs in rails, ties, car-wheels, track-splices and spikes, brattice cloth, and many tools. This all means a great loss when summed up for the year. I knew of one mine that maintained a storage track in a place 18 ft. wide, where all left-over material was taken and stored, and this material was used from time to time as needed.

As to the suggestion made in Letter No. 5, July 10, p. 61, to the effect that money spent at the right time and in the right way will often save a great expense at some later period, it is up to the foreman to determine what is necessary and where he can save future expense and avoid loss of coal, by doing certain work at the right time. The company pays its foreman for certain knowledge on his part, and he must always study the conditions carefully.

Assistant Foreman.

Bevier, Ky.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Area of Triangles—The area of a triangle is equal to one-half the product of its base and altitude. In this sense, any side of a triangle may be taken as its **base** and the **altitude** is then the line drawn from the apex of the opposite angle perpendicular to the base or the base extended.

In a **right triangle**, one of the sides about the right angle is generally considered the base and the other is then the altitude. Hence, the area of a right triangle is one-half the product of its two sides.

In finding the area of triangles other than right triangles, it is generally necessary to first calculate the altitude separately. In the two following cases, however, the area of the triangle can be found directly by the formulas given:

1. When two sides and the included angle are given:

$$\text{Area} = \frac{1}{2} (ab \sin C)$$

2. When one side and any two angles are given, it is then possible to find the third angle by subtracting the sum of those given from 180 deg. and apply the formula

$$\text{Area} = \frac{a^2 \sin B \sin C}{2 \sin A}$$

Example—(a) Find the area of a triangular field when two of its sides measure 600 and 450 ft., respectively, and the angle between them is 30 deg. (b) Find the area of the same field, when the given parts are: $a = 600$ ft.; $B = 46^\circ 56'$ and $C = 30^\circ$.

Solution—(a) $\sin 30^\circ = 0.5$; hence the area of the field is

$$\text{Area} = \frac{1}{2} (600 \times 450 \times 0.5) = 67,500 \text{ sq.ft.}$$

(b) The third angle, not given, is $A = 180^\circ - (46^\circ 56' + 30^\circ) = 103^\circ 04'$; and the known parts are

$$a = 600$$

$$\sin A = \sin 103^\circ 04' = \sin 76^\circ 56' = 0.97411$$

$$\sin B = \sin 46^\circ 56' = 0.73056$$

$$\sin C = \sin 30^\circ = 0.5$$

Hence, the required area of the field is

$$\text{Area} = \frac{600^2 \times 0.73056 \times 0.5}{2 \times 0.97411} = 67,500 \text{ sq.ft.}$$

Quadrilaterals—The quadrilaterals, or four-sided polygons, include rectangles, parallelograms, trapezoids and trapeziums. The area of the first two of these classes is equal to the product of the base and altitude.

The area of a **square** is the square of one side.

The area of a **rectangle** is the product of two adjacent sides, one being the base and the other the altitude.

The area of a **parallelogram** is the product of one of its parallel sides, called the "base," and the perpendicular distance between them, called the "altitude."

The area of a **trapezoid** is the product of the half-sum of its parallel sides and the perpendicular distance between them. The longer of the two parallel sides is the base and the perpendicular distance the altitude.

The Coal Age Pocket Book

The area of a **trapezium** is found by drawing a diagonal between two opposite angles, thus dividing the trapezium into two triangles, the sum of whose areas is equal to the required area of the trapezium.

Regular Polygons—The solution of regular polygons is based on the following formulas:

Let a = area of polygon;

o = perimeter of polygon;

l = length of one side;

n = number of sides;

R = radius of circumscribing circle;

r = radius of inscribing circle;

a = angle at center subtending one side.

Then, by the principles of geometry,

$$\text{Central angle}, \quad a = 360/n \quad (1)$$

$$\text{Side}, \quad s = 2 R \sin (\frac{1}{2} a) = 2 r \tan (\frac{1}{2} a) \quad (2)$$

$$\text{Perimeter}, \quad o = ns = 2nR \sin (\frac{1}{2} a) = 2nr \tan (\frac{1}{2} a) \quad (3)$$

$$\text{Area}, \quad a = \frac{1}{2} ro = \frac{nR^2}{2} \tan (\frac{1}{2} a) = nR^2 \sin \cos (\frac{1}{2} a) \quad (4)$$

$$[\sin \cos (\frac{1}{2} a)] = \frac{1}{2} \sin a! = \frac{1}{2} nR^2 \sin a \quad (4)$$

$$\text{Circumscribing radius}, \quad R = \frac{s}{2 \sin (\frac{1}{2} a)} = \sqrt{\frac{2a}{n \sin a}} \quad (1)$$

$$\text{Inscribing radius}, \quad r = \frac{s}{2 \tan (\frac{1}{2} a)} = \sqrt{\frac{a}{n \tan (\frac{1}{2} a)}} = R \cos (\frac{1}{2} a) \quad (2)$$

Note—The radius of the circumscribing circle furnishes the means of locating graphically the center of the polygon, which lies at the intersection of the arcs described by this radius from the apices of the polygon as centers.

Example—Find the central angle subtended by one side, the length of a side, the perimeter and area of a regular pentagon inscribed in a circle whose diameter is 50 ft.; also the radius of the inscribed circle.

Solution—A regular pentagon is a plane figure having five equal sides and angles. Then, since the radius of the circumscribing circle, in this case, is $R = \frac{1}{2} \times 50 = 25$ ft., we have

$$\text{Central angle}, \quad a = 360/5 = 72 \text{ deg.}$$

$$\text{Length of one side}, \quad s = 2 \times 25 \sin 36^\circ = 50 \times 0.5878 = 29.39 \text{ ft.}$$

$$\text{Perimeter}, \quad o = 5 \times 29.39 = 146.95 \text{ ft.}$$

$$\text{Area}, \quad a = \frac{1}{2} \times 5 \times 25^2 \sin 72^\circ = 1562.5 \times 0.95106 = 1486+ \text{ sq.ft.}$$

$$\text{Inscribing radius}, \quad r = 25 \cos 36^\circ = 25 \times 0.809 = 20.225 \text{ ft.}$$

Inquiries of General Interest

Sampling Shipments of Coal

I read with much interest the questions of R. T. M., and the reply thereto, in regard to "Standards in Analyzing Coal," *Coal Age*, Aug. 28, p. 353. This prompted me to inquire further whether the United States Government engineers have ever adopted a standard method of sampling shipments of coal, which of course is the first and most important step to determine its quality and fuel value. Since the consumer is not interested in knowing what the coal analyzes by taking a straight-cut sample from the coal in place, it would seem that the proper method to adopt, so far as he is concerned, would be to sample the coal after it has been loaded for shipment. I do not believe that a fair sample can be obtained by driving a pipe through the coal from top to bottom, or by cutting a channel on top of the load the full length of the car, or by collecting a sample here and there from the top of the car.

SUBSCRIBER.

Gallitzin, Penn.

In Technical Paper 76, entitled "Notes on the Sampling and Analysis of Coal," by A. C. Fieldner, the Bureau of Mines, in addition to explaining in detail its method of collecting samples from the mine, discusses "The Relation of Mine Samples to Commercial Shipments." On page 13 the author states: "In drawing deductions from the mine-sample analysis, in regard to the quality of coal shipped from the mine, due allowance must be made for the larger proportion of impurities that may be included in the commercial operation of the mine."

It is generally recognized that in the mining, handling and loading of the coal for shipment it is practically impossible to prevent the inclusion of more or less foreign matter, and the author of Technical Paper 76 concludes that the mine-sample analysis, therefore, usually indicates a better grade of coal in respect to the ash content and heating value of the coal than is true of the commercial shipments.

Bulletin 63 of the Bureau of Mines, entitled "Sampling Coal Deliveries," draws attention to the same difference between mine sampling and the sampling of commercial shipments. In the purchase of coal for the Government it was recognized that the specification should include a definite commercial procedure in sampling shipments; and as a result of a conference the method adopted was outlined and included in the printed specifications.

The details of this method of sampling are given on pages 56 and 57 of the same bulletin. This consisted, practically, of taking shovelfuls from the shipment while being unloaded. Thus, small increments of from 10 to 30 lb. were taken at regular intervals during the time of unloading, so that a gross sample of 1000 lb. was obtained. This gross sample consisted of small and large sizes, and was later crushed and reduced in the usual manner to a convenient sample for laboratory use. In the case of large-sized lumps a gross sample of 1500 lb. or more was

taken. But the specifications state that for slack coal and for small sizes of anthracite, if the impurities do not exist in abnormal quantity or in size larger than $\frac{3}{4}$ in., a gross sample of about 600 lb. is sufficient.

Starting an Electric Motor

There is a question that I would like to see discussed or answered in *Coal Age*: Assuming an electric haulage locomotive of 500 volts capacity is standing with the controller wide open and that while in this position the trolley pole is raised to the wire, will the armature be burned out as a result? We all know that the instructions are to first see that the controller is closed, so that no current can pass, before raising the trolley pole to the wire. Then, when the trolley pole is in position and you desire to start the motor, open the controller gradually, passing it from point to point as the motor gains speed. While I have seen armatures burned out under conditions similar to those mentioned, I have never been able to satisfy myself fully as to the cause.

T. W. ENGLISH.

Olyphant Furnace, Penn.

If the controller is wide open when the trolley pole is brought in contact with the wire, there will be a sudden rush of current greater than that which the armature is designed to carry, and as a consequence the armature would then be burned out.

When current from the trolley wire passes through the armature, it meets with a certain resistance due to the resistance of the winding. If the current passing generates a torque greater than that required to overcome the friction of the journals and revolves the armature, there is at once created an electromotive force that is opposed to that transmitting the current. This "counter-electromotive force," as it is called, acts as an additional resistance to the revolution of the armature and reduces the torque. Therefore, to maintain the speed of revolution, more current must be supplied to the armature.

As the speed of revolution is increased, the counter-electromotive force also increases, and as a result, when a uniform speed of revolution has been attained, there is a resistance due to the counter-electromotive force that the current flowing through the armature must overcome in addition to the resistance in the winding. In other words, the torque required to overcome the frictional resistance of the journals and revolve the armature at a uniform speed is reduced by the counter-electromotive force set up in the field.

Now, it will be readily understood that if the entire current is permitted to pass through the armature by bringing the trolley in contact with the wire when the controller is wide open, there is no counter-electromotive force present; and—the resistance opposing the flow of the current through the armature being much less—a greater current flows through the winding than the carrying capacity of the wire will permit and a burn-out results.

Examination Questions

Tennessee Examination for Mine Foremen, Assistant Foremen and Firebosses

(Selected Questions)

Ques.—You have a wide room that is generating a considerable amount of marsh gas at the face. You decide to temporarily ventilate this room by a line of brattice, which you can run up either side of the room, but which can reach only to within 15 or 20 ft. of the face, on account of the shooting tearing it down. If the brattice is put on the right side of the room, the air will be intake behind the brattice and return in the room. If it is put on the left side, the air will be intake in the room and return behind the brattice. There is enough air, in either case, to dilute the gas so that the return will be harmless. On which side of the room would it be best to erect this brattice, in order to keep the room most clear of gas? State your reasons.

Ans.—The brattice should be erected on the right side of the room, so that the intake air will be carried up behind the brattice. The air current will then be directed with greater force against the face and will sweep the entire face of the room, which is important in order to prevent any accumulation of gas in the corners of the room where the air does not strike. Again, if the brattice was to be erected on the left side of the room so as to conduct the return current out of the room, its area would require to be much larger than before, because of the increased volume of the return current, due to the presence of the gas. Also, there would be danger that much of the gas would eddy where it should enter the brattice on the return side. This condition could not occur if the brattice were erected on the right side of the room and there would then be less danger of gas accumulating in the room back a distance from the face, as when the entire room is swept by the return air. It is assumed that the wide room mentioned in this question is a double stall with the waste thrown back in the center of the room, there being a roadway on each side. The brattice is necessary here because the waste does not completely fill the space to the roof and the air does not reach the face.

Ques.—Referring to the last question, if you had succeeded in keeping the room clear of gas and a bad fall should occur in the face of the room, the roof falling so high that a quantity of gas continued to hang above the fall ahead of the line of brattice, how would you proceed to keep the space clear over the fall?

Ans.—It is difficult to answer this question without knowing the exact situation. However, in general, it may be said that in order to sweep the gas from above the fall, it will be necessary to erect a special form of brattice that will direct the current over the fall in such a manner as to carry away the gas.

Ques.—Explain what you understand by a "windy shot." What are the usual reasons or conditions that may produce such a shot?

Ans.—A "windy shot" is one that produces a more or less heavy concussion of the air so that it is felt at a considerable distance from the place where the shot is fired. A windy shot may result from an overcharge of powder, which causes the rupture of the coal before all of the powder has been burned. As a consequence, the powder remaining unburned when rupture takes place is largely exploded in the mine air. Practically the same thing may result with a normal charge of powder when the coal has been weakened or creviced by undue roof pressure or by the explosion of a previous shot. In that case much of the force of the shot is expended on the mine air as before. Under these conditions there often results what is known as a "squealer," this name being suggested by the shrill sound produced by the gases escaping through the crevices when the shot is fired.

A windy shot is not apt to be as dangerous as a blowout shot under the same conditions, because the heat and force developed are much less in the former case. A blowout shot is one in which the shot has blown its tamping without breaking the coal. In this case the flame and gases of the shot are projected from the hole with great force. A blowout shot may arise from a variety of causes, but is most frequently due to a "tight shot" where the charge is laid too deeply on the solid, or the shot is bound by projecting tops or bottoms in such a way that the powder cannot break down the coal. A blowout shot may be due to insufficient tamping or too large a diameter of hole for the charge of powder employed, in which case the force of the exploding powder is not sufficiently distributed in the coal to produce rupture, owing to the concentration of the charge.

Ques.—(a) About what velocity of air would you consider advisable in the main air courses, in order that the current shall be able to keep the working faces clear of gas, but so that fine dust will not be carried in suspension in the current or that there shall not be an excessive amount of friction? (b) What should be the sectional area of the airways in order to maintain this velocity and supply the above-mentioned amount of air? State the width and height of the airways.

Ans.—(a) The velocity of the main air current may vary from, say, 600 to 1000 ft. per min., without causing undue danger from the carrying of dust in suspension in the air. The velocity in any particular case, however, will depend on the conditions existing in the mine with respect to the fineness and the amount of dust present. On the other hand, as stated in the answer to the previous question, the air volume required for the entire mine will depend on the number of splits and the velocity required at the working face.

(b) Assuming, however, a total air volume of, say, 60,000 cu.ft. per min., the required sectional area of the main airway will vary from 100 sq.ft. for a velocity of 600 ft. per min. to 60 sq.ft. for a velocity of 1000 ft. per min., depending on the conditions as previously stated. These velocities of the air current will not produce an excessive amount of frictional resistance.

Coal and Coke News

Washington, D. C.

A phase of the recent coal decisions of the Interstate Commerce Commission that has thus far received comparatively little attention, but is likely to figure a good deal in the discussion of the situation is found in the data compiled to show the real freight revenue yielded to the anthracite coal roads from their coal business. Probably the work done by the Commerce Commission on this phase of the matter is as elaborate and detailed as, if not more so than, any other element of its inquiries.

The Commission takes as a basis of comparison in the matter of revenue the showing of revenue made by 69 carriers in the recent "five per cent. case" and presents an extensive compilation of the income derived from various items of freight by these carriers as follows (carload lots being taken as the basis of computation):

Article	Average Net Income per Loaded Car-Mile, Cents
Hemlock lumber	28
Hides	24
Brick, stone, etc.	22
Iron ores	20
Cement (in sacks)	22
Pulp wood	13
Sheep	7
Cattle	6
Hogs	7
Corn syrup	6

The foregoing is merely a selection of some of the highest and some of the lowest yields obtained from various commodities in a large group, results for which are presented by the Commission. With this representative showing for the commodities transported by the 69 well-known carriers taken as a basis may be compared the figures for the coal roads showing their revenue per loaded car-mile on all sizes of coal averaged.

Road (to Tidewater)	Rev. per Loaded Car-Mile, Cents
Pa. Ry. & Northern Central Ry.	23.07
N. Y., O. & W.	23.86
Reading	25.70
Erie lines	31.64
Lackawanna	32.86
Lehigh Valley	34.94
Jersey Central	41.05

To Buffalo (instead of tidewater) the net revenues are lower but were still substantial, most of them being well above 20c. Comparing the results with those for the 69 carriers above referred to, it is seen that the incomes on anthracite coal rank with the highest from any other commodity. In fact there is no road that presents a net revenue on anthracite coal, as indicated by these figures that is not materially above the great majority of the revenues for various commodities reported by the 69 carriers referred to as an average.

Further, as the Commission clearly shows, the present mode of hauling anthracite is in trains that transport the maximum train tonnage. Large tonnages hauled in these trains mean very high revenues per train-mile. Some of the figures compiled by the Commission to show comparative train-mile revenue may be stated as follows:

Road	Freight Revenue per Train-Mile
A. C. L. RR. Co.	\$2.696
B. & O. R.R. Co.	3.474
C. & O. Ry. Co.	3.471
L. & N. R.R. Co.	2.295
N. Y. C. & H. R. RR. Co.	3.028
Virginian Ry. Co.	4.567
U. S. roads, as a whole	3.0228

As against this the Commission states that the revenue on anthracite coal earned from the mines to tidewater is per train-mile \$19.30 for the Jersey Central; \$16.14 for the Lehigh Valley; and \$16.43 for the Lackawanna.

It has been suggested in some quarters that these figures are vitiated by the fact that the work of the anthracite coal roads is not confined to the hauling of anthracite but includes a large amount of other articles. How much weight must be given to this argument may be judged from a computation of data given by the Commission in an appendix and showing the proportion of total traffic over the coal roads furnished

by the anthracite coal. Some of these figures are given as follows:

Road	Ratio of Coal to Total Tonnage, Per Cent.	Ratio of Coal to Total Freight Revenue, Per Cent.
Central RR. of N. J.	31.5	46
Phila. & Reading	24.4	32.6
D. L. & W.	41.9	49.8
Del. & Hudson	44.8	49
Lehigh Valley	45.5	50.5
N. Y. O. & W. Ry.	70.2	63.6
Wilkes-Barre & Eastern	80.9	85.9
N. Y., Susquehanna & Western	64.7	48.6

This shows the proportion of total operations in which anthracite coal figured and consequently indicates in some degree the extent to which the higher revenues carried on coal are characteristic of the general business of the coal lines.

Allowance is not made in the foregoing figures for the return movement of empty coal cars, the anthracite traffic being peculiar in that it is largely a one-way business. The inclusion of the empty movement makes a change in the mileage revenue returns but leaves them substantial, as may be seen from the following comparison:

Road	Revenue per Loaded Car-Mile, Cents	Revenue per Car-Mile, Including Empty Movement, Cents
Pennsylvania	23.07	11.56
Ont. & Western	23.86	11.96
Reading	25.70	12.85
Erie	31.64	16.41
Lackawanna	32.86	17.72
Lehigh Valley	34.94	18.29
Jersey Central	41.05	21.22

From this showing the conclusion drawn by the Commission is that the returns drawn by the carriers from their movement of anthracite are "remunerative."

Improvements at Panama

Advices from the Isthmus show that material improvement is being made in methods of handling coal at Panama. A project has been approved by which several berths at the commercial piers at each terminus will be fitted with booms for using the conveyors in unloading cars into ships' bunkers. The four conveyors now in service are used on barges and bunker vessels at dock from the offshore side, and the new equipment will make it practicable to bunker vessels from both sides while they are discharging cargo. It is proposed to install two conveyors on both sides of Pier 8 at Cristobal, two on the front of wharf No. 9 and two on each side of Pier 7 when constructed. They will unload from a special type of car consisting of a Lidgerwood flat car built up with 5-ft. sides and ends, forming a compartment 38 ft. long which will hold from 45 to 50 tons of coal.

Dating from Sept. 1 the price of coal has been increased to \$6 per ton at Cristobal and \$7 per ton at Balboa.

HARRISBURG, PENN.

Preliminaries to the organization of the workmen's compensation system for Pennsylvania were arranged recently at a conference of the members of the new Workmen's Compensation Board and state officials with Attorney General Brown.

Harry A. Mackey, Philadelphia; J. W. Beech, Ebensburg, and John A. Scott, Indiana are the members of the Compensation Board and Insurance Commissioner Johnson, State Treasurer Young and Commissioner of Labor and Industry Jackson comprise the Insurance Board.

The organization of the insurance fund, for whose administration the state made an appropriation of \$300,000 will be first. It will be laid out as soon as possible and men familiar with insurance matters will be placed in charge of various features. It is probable that within a few weeks the making of schedules, establishment of premiums and other details will be under way.

One interesting feature of the state's insurance fund will be an elaborate system of advertising of its advantages. This will be done through Smull's Legislative Hand Book, which will devote six pages to the fund, through folders and by placing of matter in envelopes sent on state business. The

fund itself will be created out of the premiums paid by employees. The state will pay the expenses.

Part of the plan is to have men stationed in various cities of the state in charge of branch headquarters for business for the fund and these men will visit employers and explain the merits of the state system. According to inquiries made, several liability companies will be formed and some of the existing companies will also go after business of insuring employers.

PENNSYLVANIA

Anthracite

Mahanoy City—The Philadelphia & Reading Coal & Iron Co., through President W. J. Richards, of Pottsville, has donated to the people of Gilberton a strip of ground to be utilized as a playground for the children. The company is also furnishing teams and implements for placing the site in shape.

Scranton—Under a contract granted by the state, the Drake Drilling Co., of Hazleton, has begun the work of saving the state armory from destruction by mine caves. Settlings in the workings beneath the building two months ago allowed the foundation walls and sides to crack and little can be done to remodel the building until new foundations are placed on solid ground. Concrete pillars are to take the place of the present foundation walls and allowance will be made for further settling of the surface.

Pottsville—A coal case 43 years old was decided recently by the Schuylkill County Court. The decision gives the Lawrence Colliery Co. the right to remove all the coal under the tracks of the Reading railway company on the Mahanoy Plane, where the coal is hoisted over the mountain, providing some other support for the surface is provided. It releases coal estimated to be worth \$1,000,000. The suit was originally brought in 1872 against Lawrence, Merkel & Kerr. When the partnership was dissolved the case was continued against Lawrence & Brown, the present owners. The questions were decided by lower and Supreme Courts at the time and in 1873 another case was started. Evidence was taken before C. F. Shibe, the master, 13 years later, but he died before rendering a decision, being followed by F. W. Bechtel, who also died before deciding the case. Then ex-Congressman J. B. Reilly was appointed, and his work of the last several years was approved by the court on Sept. 6. In making the decision the court found it necessary to review 8,000 typewritten pages of evidence.

Summit Hill—Steam issuing from a point near the concrete wall erected by the Lehigh Coal & Navigation Co. to check the fire which has been burning for upwards of 60 years, indicates that the progress of the fire is now such as to determine whether or not it is going to be checked by the barrier erected for that purpose. For over a year stripping operations have been going on near the wall and the work is now being prosecuted with such energy that about 300 cars of coal are being taken out daily. Great hopes are entertained that the fire will not pass the wall, but if it does it is thought that the stripping operations have progressed to a point where the fire may be extinguished. This fire has cost the company several millions of dollars in coal and the efforts to check it.

Bituminous

Blairsville—Coal operators about Tunnelton, White and Foster are looking for men. While men for all classes of work are wanted the crying need is for miners. Italians, Lithuanians, Austrians, Hungarians and other foreigners, whose governments are at war, have quietly disappeared from this territory and none have come to fill their places. Several mines in Josephine are now rushed with export coal orders which must be filled in a stipulated time. In Clearfield, Clarion and Westmoreland Counties 2,500 miners and an additional 1,500 laborers can find employment in the coal mines and wages are today better than for years. Export orders for quick delivery are now coming from all parts of the globe, especially for steam coal, but many coal operators, it is reported, are compelled to refuse them on account of shortage of men.

Connellsville—A cargo of 5,800 tons of coke, manufactured by the Consolidated Connellsville Coke Co., was shipped recently to private interests in Italy. The sale was made through jobbers so the manufacturers do not know the real consignees. The Tower Hill plant No. 2 is being put in first class running order as is also Thompson No. 2 plant. The Ramsey interests are gradually adding more ovens at their Allison plants. The Orient plant has been placed in running order and is waiting the price which it is felt will come before putting the ovens in full. Altogether conditions for the latter quarter of the year are very good with extra-

ordinarily flattering prospects for the workers and merchants of the community.

Scottdale—Word has been received at the Scottdale offices of the H. C. Frick Coke Co., that the awards have been officially fixed by the superior jury of the Panama-Pacific International Exposition to cover the exhibits of the United States Steel Corporation and its subsidiary companies and among these awards is one to the H. C. Frick Coke Co., as follows: Medal of honor for combined exhibit including a model of a modern coal and coke plant, relief map of the Connellsville region and 9 ft. channel section representing thickness of coal seam, also samples of coal from mines. Also for five simple cubes showing character of coal from the mines of the U. S. Coal & Coke Co., the Bunsen Coal Co., and the National Mining Co.

California—The Vesta Coal Co., at its Washington County, Penn., plant will shortly begin the construction of what is said to be the longest mine siding in the world, now nearly three miles in length and which will be extended from the pit mouth a distance of over 5,000 ft. back into the hill. The construction of this siding is for the purpose of handling the coal on the tipple to better advantage. The track will accommodate the storage of more than 500 cars and will be double tracked, one track for loaded cars and the other for empties.

Uniontown—The existence of fires of threatening proportions in several of the abandoned mines of Fayette County, Penn., raises the question as to who is responsible for extinguishing them. Mine fires are never easy to extinguish and the bigger they are the heavier the undertaking becomes. Mine fires in this region have been known to burn for years in spite of continued efforts to quench the flames and the destruction wrought has not always been confined to the property of the mine owner, but has spread to adjoining properties. Most mine fires menace other property than that of the owners of the mine and there arises the question of public duty in such a case.

WEST VIRGINIA

Wheeling—Following an inspection by state officials, the mine of the Elm Grove Coal Co. was recently ordered closed. It is alleged that the mine is not properly wired, and several other changes have been recommended. This is one of the oldest mines in the Wheeling district.

Morgantown—The Mine Extension Department of the West Virginia University last year had one man doing field work. This year three men have been sent out, each having a certain district in which to work, including about five regular mine districts. These men will establish 10 points where demonstration classes will be conducted, each place being visited every two weeks. In many instances these classes will be conducted under the auspices of the Y. M. C. A. or organizations maintained by the coal company.

Coal operators of southern West Virginia assert that the increase in rates on coal shipments to points west of the Mississippi River will be highly injurious to the coal industry of this state. These operators favor concerted action to oppose such rates.

Thomas—The Davis Coal & Coke Co. will start its new plant near Bloomington within a few days. A boiler and power house have been erected on Savage River for the old Buxton mine. This plant will have a daily output of about 800 tons. Coal activities are increasing in the Fairmont field, and by the first of October it is believed that the coal business will be as brisk as it ever was in that section.

Powhatan—The coal tipple of the Powhatan Coal & Coke Co. was destroyed by fire late Sept. 8, resulting in a loss estimated at \$35,000 to \$40,000. The structure was insured. The origin of the fire has not yet been determined. Plans are being drawn to erect a modern steel tipple with the most modern machinery. Work will be resumed in a few days, a temporary chute being erected immediately for loading cars. Only run-of-mine coal, however, will be loaded by this means.

VIRGINIA

Bristol—Unusual activity is reported to exist in the coal-mining industry in eastern Kentucky and southwest Virginia. One coal mining company is advertising for 1,500 additional miners, while many coal-producing firms are making extensive improvements. It is believed that the movement of coal for export from this region will be heavy when the docks at Charleston are completed.

ALABAMA

Birmingham—The Sloss-Sheffield Steel & Iron Co. recently requested the City Commission for permission to light the coke ovens near its furnace. This matter was taken under advisement by the City Commission, and no definite action is expected for a few days.

KENTUCKY

Artemus—The Dean Coal Co., whose mines have been closed since last February, will reopen Oct. 1. They are operating in the Dean seam.

Sebree—The Jefferson County Bank, Birmingham, Ala., purchased the Sebree coal mines at a court sale recently for \$8,880. The purchase will not affect the present management, the Sebree Mining Co., which will continue to operate the property under lease.

Paducah—A conference of western Kentucky coal operators and Illinois Central traffic officials was held here recently for the purpose of considering a proposed advance in freight rates to Jackson, Natchez, Vicksburg and other Mississippi Valley cities. It is asserted that the advance would give Alabama coal an advantage of 30c. in reaching the markets referred to, and would shut out western Kentucky coal. The operators will lay the case before the Interstate Commerce Commission.

OHIO

Steubenville—The plant of the Dexter Coal Co., near this city, which was equipped several years ago at a cost of \$125,000, has been sold by the receiver under order of the United States district court to George C. Watt, of Braddock, Penn., at his bid of \$9,100. The purchaser will operate the plant, it is announced.

Bellaire—All records were broken Sept. 9 at the Rail & River Mine No. 1 for a single day's output. Approximately 2560 tons of coal were delivered to the tipple, which is believed to be not only the record for this individual mine but also for the county.

St. Clairsville—Three coal miners recently filed suit against the Purseglove-Maher Coal Co. to recover wages claimed to be due them for work from Aug. 1 to 25. This is a test case and is the outgrowth of conditions arising during the strike when for a long period the employees of the coal company lived in the company's houses and dealt at the company's store becoming deeply indebted thereto. Instead of now paying the men their wages in cash, the company is giving them receipts for rental and grocery bills. The suit is filed on the ground that not more than 10 per cent. of the wages of a married man may be attached.

INDIANA

Boonville—The Hartwell Coal Co., operating in Pike County, Ind., is reported to have plans for resuming operations in the immediate future. The company controls 2,400 acres of coal lands.

ILLINOIS

Muncie—A suit has been filed in the circuit court by the Pocahontas-Winifrede Coal Co., of Huntington, W. Va., asking for the appointment of a receiver for the T. L. Westlick Coal Co.

Danville—The Illinois Central R.R. Co. recently filed in the Federal Court here a petition asking that a restraining order be directed against the Interstate Commerce Commission. This case is the outgrowth of the coal service in September, 1913, when the Groom Coal Co., the Vulcan Coal & Mining Co., and the St. Louis-Coulterville Coal Co., asked the Commission to assess damages against the railroad company. The railroad company asked that the case be tried in the court at once. The alleged shortage of cars in the coal district caused repeated complaints to be made to the State Service Commission and the Interstate Commerce Commission; the latter body finally began an inquiry.

Belleville—Thomas C. Wright, St. Clair County Mine Inspector, has filed his annual report. He says that the 69 mines in the county for the 12 months ending Aug. 31 produced 3,017,820 tons of coal, a decrease of 1,099,182 tons from the previous year. The total of men employed for the last year was 3,944 against 4,738 for the previous year. There were 34 non-fatal accidents in the year against 55 for the previous year. Five men were killed during the year. There are 36 shipping mines in the county but 17 of them did not operate because of business conditions in the district. The shipping mines under operation averaged 145 days during the year and the local mines 180 days.

COLORADO

Hayden—The Victor-American Fuel Co., which several months ago purchased a ranch near Hayden, Colo., is laying off a townsite there. It is near the coal tract adjoining the Harris mine.

Denver—The Victor-American Fuel Co. has filed with the secretary of Colorado a reservation of the name The Colorado Coal Co. It is said that the company wishes to hold the name for the purpose of using it in connection with a mine which it will open in the future.

Representatives of the coal companies of Colorado met recently with the state industrial commission to discuss the rate of insurance to be charged the coal operators under the Workmen's Compensation Act and other features of the law which concern the coal companies. The operators declared that a 7 per cent. insurance rate would put most of the small companies of the state out of business. S. M. Petty, president and general manager of the Leyden and Moffat coal companies stated that one of their mines would have to close immediately.

Durango—Federal Judge Trieber, sitting in the absence of Judge Robert E. Lewis at Denver, Colo., recently dismissed the indictments filed more than 8 years ago against the Porter Fuel Co. for alleged conspiracy and fraud in obtaining approximately 2,790 acres of rich coal lands near Durango in La Plata County. These lands now belong to the Union Pacific Coal Co. and are valued at more than \$500,000. There has never been any question concerning conspiracy in relation to the Union Pacific Coal Co. This is one of the most famous cases ever tried in Denver.

FOREIGN NEWS

Vancouver, B. C.—Announcement was recently made that the Attorney-General of British Columbia had laid indictments for manslaughter against Thomas Graham and J. H. Tonkin, charging them with carelessness in connection with the disaster which caused the loss of 19 lives in the Reserve mine near Nanaimo on Feb. 15 last. Graham is Chief Inspector of Mines for the Provincial Government, while Tonkin is manager of the Pacific Coast Coal Co. A blast in the Reserve mine broke the barrier wall separating it from the old workings of the South Wellington mine, which had long been flooded with water. This break in the barrier caused the death of 19 miners by drowning.

PERSONALS

Edward H. Coxe, mining engineer, of Knoxville, Tenn., left recently for a trip to Denver and the coal fields of Routt County, Colo.

Thomas L. Lewis, former president of the United Mine Workers of America, is now a salaried employee of the West Virginia Coal Operators' Association, with an office in Charleston, W. Va.

J. R. Fleming, of Bear River, Routt County, Colo., has resigned his position as local manager for the Bear River Coal Co. of that place, and, as soon as his successor is appointed, will remove to Utah to look after coal interests that he has in that state.

David Reese, for many years connected with the Victor-American Fuel Co. at Hastings, has been appointed a member of the Colorado state board of coal mine examiners by Judge A. W. McHendrie, of the third judicial district, empowered by statute to appoint one member.

Benjamin B. Thayer, president of the Anaconda Copper Mining Co., and William L. Saunders, chairman of the board of directors of the Ingersoll-Rand Co., both members of the American Institute of Mining Engineers, have been appointed to the Naval Advisory Commission.

J. C. Roberts, of the U. S. Bureau of Mines, has had a corps of men working at the top of Pikes Peak, Colo., with appliances for mine rescue work. He has made a number of important and interesting tests in that high altitude, but is not ready yet to make his discoveries public.

L. W. Brown, superintendent of the Richland Coal Co. of South Warwood, W. Va., has left for Bolivia, South America, where he will open a tin mine for West Virginia capitalists. The tin deposits in question are 12,000 ft. above sea level, and a railroad is projected to reach these mines.

Perry Barker, fuel engineer, has opened an office and laboratories in the Oliver Bldg., 141 Milk St., Boston, Mass. He is equipped to be of service to both dealers and consumers and will make investigations, tests and reports on the preparation and use of coal and coke for various purposes.

Messrs. Joseph J. Keegan and Hilliard J. Rosencrantz are in charge as managing directors of the Far Eastern Division of Gaston, Williams & Wigmore, Inc., of 140 Broadway, New York City. This division has been organized and equipped to develop markets for American industries in the Orient.

C. E. Bullard, who has for the past four years been cashier of the Carter Coal Co. at Warren, Ky., has been promoted to the superintendency of the Carter Coal Co. at Anchor, Ky. Prior to his connection with the Carter company in Kentucky, Mr. Bullard was chief clerk to the general superintendent of the Virginia Pocahontas Coal Co. at Coalwood, W. Va.

W. W. Hall, who has been salesman for the George D. Whitcomb Co. of Rochelle, Ill., with office in the Blackstone Bldg., Ashland, Ky., has resigned his position with that firm and taken the sales management of the Ironton Engine Co., Ironton, Ohio, which company is going to manufacture a complete line of coal mining machinery, making a specialty of coal cutting and hauling machinery.

Herbert M. Wilson, director of the Department of Inspection and Safety of The Associated Insurance Companies, formerly of the Bureau of Mines, will be in San Francisco, Sept. 16 to 25, participating in the various engineering congresses. He will be actively concerned in the first-aid and mine-rescue demonstrations and contests of the Board of Managers, of which he is chairman. He is also scheduled to read papers on mine safety and on workmen's compensation before the mining sections of the International Engineering Congress, the American Mining Congress, and the World's Insurance Congress. Going to and coming from the Pacific Coast, Mr. Wilson will visit various coal mining states for the purpose of perfecting arrangements for inspection of mines for insurance by The Associated Companies under workmen's compensation.

OBITUARY

Louis Florien DeSaulles, 69 years of age, died at his home in Uniontown, Penn., Sept. 6, as the result of a bullet wound in the head, self inflicted. Mr. DeSaulles was born in New Orleans in 1846 and at the outbreak of the war young DeSaulles and his mother went to France where the mother still lives at Pau, being 98 years of age. At the close of the war Mr. DeSaulles returned to America and engaged in business and later came to this section of Pennsylvania where he became interested in the development of Fayette County coal. He and the late George Marshall and others opened one of the first coke plants in the county at Percy. This has long since been worked out and abandoned but many of the present day leaders in coal and coke operations in this section served their apprenticeships under Mr. DeSaulles when the plant at Percy was in its prime.

Ernest H. Abend, principal owner of the Abend coal mine, one mile north of Belleville, Ill., in which city he resided, was found dead recently at the bottom of a 150-ft. shaft in his mine. He was 54 years of age, wealthy and unmarried. The circumstances of his death are unknown. Two theories are advanced: One that he lost his balance while making an inspection; the other that he walked into the shaft after lifting the safety gate. The elevator was at the bottom of the shaft. Mr. Abend had gone to the mine, as had been his daily custom since the recent extraordinary rains, to inspect the work of the men operating the pumps. On reaching the mine he had a conference with Frank Oexner, his chief engineer, and left him to go into the mine. A few minutes later Foreman Martin Kirkwood, at work near the bottom of the elevator shaft, heard an object strike the elevator and upon examination found Mr. Abend's body.

INDUSTRIAL NEWS

Henrietta, Okla.—The Junior Coal Co. is installing a large Bucyrus steam shovel.

Henrietta, Okla.—The Fidelity Fuel Co. is planning to sink two new shafts in the near future.

Bellaire, Ohio—It is asserted that the Pittsburgh Vein Coal Operators' Association is considering the matter of moving its headquarters from Wheeling to Bellaire. It is believed that decisive action on this matter will be taken in the near future.

Springfield, Ill.—On Saturday, Oct. 2, an examination will be held at various towns in Illinois to fill several positions in Illinois Civil Service. Among these is a chief clerk of the Mining Board. This is open to men over 25 years of age and carries a salary of \$125 to \$175 per month.

Charleston, S. C.—The "International," the first coal boat of the Clinchfield Navigation Co., has been loaded with coal

at Charleston. It is understood that this is the first of the fleet of vessels which will be operated by the Clinchfield Navigation Co. in handling export coal from this port.

Hartford, Conn.—The S. K. F. Ball Bearing Co. of Hartford, Conn., was recently organized with a capital stock of \$2,000,000. The object of this organization is the manufacture and sale in this country of the ball bearings of this name, these heretofore having been all imported from Sweden.

Pittsburgh, Penn.—Record-breaking coal shipments to the Duquesne docks of the Monongahela River Consolidated Coal & Coke Co. were recently made from the company's mines along the Monongahela River. These shipments were for steel mills and are said to have been 2000 to 3000 tons per day in excess of former shipments. Five towboats were employed.

Huntington, W. Va.—If the first few days of the month are a criterion, all coal-loading records of the Chesapeake & Ohio R.R. will be exceeded in September. The total tonnage of coal handled during August was 2,423,000 tons, and it is believed that during September this will be increased to 2,450,000 tons. This would exceed all previous coal loading tonnages.

Charleroi, Penn.—The biggest monthly shipments of coal since October of 1913 are reported by the lockmaster at Lock No. 4 on the Monongahela River, in his report for the month of August. There were 446 lockages upstream, including 319 steamboats, 1,533 barges and flats. Downstream the traffic was 450 lockages, 318 steamboats, 1,564 barges and flats and 19,638,000 bu. of coal. In October, 1913, the total shipments of coal were 19,933,000 bu., which is but slightly above the August record of the present year.

Baltimore, Md.—The report on coal mining in Maryland during the fiscal year ending May 1 has just been made to Governor Goldsborough. The report shows a total of 3,888,611 tons mined during the period, a decrease of 551,033 tons from the tonnage of the same period of the year previous. A total number of 5,480 persons were employed in coal mining in the state, a decrease of 79. Decreased tonnage was blamed on the partial or complete shutdown of mining properties from time to time as a result of poor demand generally for fuel.

Bluefield, W. Va.—The total tonnage handled by the Norfolk & Western R.R. during the month of August was coal, 2,934,000 tons; coke, approximately 74,000 tons, which brings the total fuel shipments of the road to over 3,000,000 tons. The prospects are bright for the coal tonnage alone passing the 3,000,000 mark during the month of September. The recent installation of the electric system has aided materially in handling this immense tonnage, a large portion of which has been eastbound, the foreign trade being exceptionally heavy.

Connellsville, Penn.—The Connellsville coke region is now operating at approximately 75 per cent. of its rated capacity, and production has risen to over 390,000 tons per week. The wages being paid are the highest in the history of coking. It has been estimated that within the past few weeks the Pittsburgh district has been forced to decline export steel orders amounting to 300,000 tons, the mills having orders sufficient to keep them running to capacity for the remainder of the current year. Domestic needs are also increasing, and it is estimated that purchases of railroad supplies during the remainder of 1915 will be 30 per cent. larger than for any corresponding period in the past two years.

Columbus, Ohio—Readjustment of bituminous coal freight rates which would give to Ohio coal producers an increased differential, it is stated has been agreed to by the railroads operating in Ohio, West Virginia, and Pennsylvania. Officials of these roads, at a recent conference, decided to file with the Interstate Commerce Commission the new schedule of freight rates on coal from West Virginia to all points in Ohio, Michigan, and Indiana, which, if approved, would fix a new differential in favor of Ohio coal operators at 40c. a ton, as against 25c., which has prevailed for some time. Ohio operators have long contended that under the existing rates they are unable to successfully compete with coal producers in West Virginia.

St. Louis, Mo.—The Lumaghi Coal Co. has received notice from the Illinois Public Utilities Commission that its complaint against the advance of 5½c. a ton in rates from the Illinois coal fields to East St. Louis, Madison and Granite City, Ill., had been overruled and that the advance would become effective Oct. 1. This will make the differential between shipments to this side and the east side of the river 20c., which was the figure for a number of years, but two years ago, when the Interstate Commerce Commission passed upon the application for increased rates, the advance to St. Louis became effective at once, making a rate from nearby mines of 57½c., while the rate of 32c. to east side towns obtained. The complaint against the advance within Illinois has made a differential of 25½c. during this period.

Coal Trade Reviews

General Review

Unseasonably hot weather causes a sharp relapse in anthracite. Bituminous still benefiting by the general expansion in manufacturing. Export business continues to expand. Pittsburgh district consuming at a record rate. Lake tonnage larger.

Anthracite—The unexpected and almost unprecedented spell of hot weather has caused a sharp relapse in the hard-coal trade, which has subsided into as dull a situation as prevailed during mid-summer. It is clear that dealers' bins are stocked up close to full capacity, and this coal will have to start moving out to the consumers before any activity can be expected. The stimulus resulting from the brief period of cool weather a week ago has entirely disappeared, and business that was refused at that time is now being eagerly sought. However, it is evident that stocks in the consumers' hands are considerably below normal, shipments for the year to date being close to 2,000,000 tons less than the corresponding period last year, and any ordinary cold weather should start the coal moving rapidly.

Bituminous—The various constructive factors in the market still prevail and prices are fairly firm both for spot and forward delivery. Occasional market cargoes are difficult to move but as a rule the shippers are very conservative over future commitments, and there is increasing evidence that the export trade will prove a potent factor in the local market. The slow expansion in general industrial conditions is undoubtedly carrying the coal trade with it on to better things. The possibility of a car and labor shortage continue to be threatening features in the situation. Spot business is generally at a standstill but the movement on contracts is fair.

Exports—The export business continues fully up to the high average maintained last month, and there seems to be a tendency to advance prices in this direction. The demand from Europe is constantly increasing and it is becoming evident that foreign countries are being forced to rely more and more on this country for their fuel supply. Some accumulation of coal is occasionally noted at Tidewater but a number of the heavier shippers in the off-shore trade are having difficulty in keeping sufficient coal on hand to take care of the vessel tonnage as it arrives. The number of vessels bunkering is notably less, but the deficiency is probably made up by most vessels taking sufficient coal for the round trip. The growing scarcity of vessel tonnage continues the chief depressing factor in the export situation.

Lake Market—With the steel mills in the Pittsburgh district outputting a greater tonnage than ever before in their history, the coal consumption in this line is undoubtedly at a record rate. Railroads are also increasing their demand, which is now practically normal, and there is a generally good movement in all directions with indications of a steady though slow improvement. Prices have stiffened, and there is a tendency toward higher levels on new contracts, but no important increase can be expected until some such emergency as a car or labor shortage develops. Canada continues in the grip of a war paralysis with business generally at a standstill and the situation further accentuated by the violent fluctuations in the rates of exchange.

The domestic trade in Ohio has suffered severely as a result of the recent hot weather, although it is generally agreed that stocks in the hands of the consumers are light, and the return of colder weather will precipitate a sharp rush for coal. In steam lines the outlook continues optimistic. There has been sufficient business negotiated in some sections to develop a car shortage, which was distinctly noticeable. Large steam consumers are also showing a disposition to cover their requirements against a further price advance, and the railroads are accumulating substantial reserve supplies to provide for emergencies. Considerably less consignment coal is noted on demurrage than for some time.

A year ago.—Anthracite is slowing down to a more normal basis, but an active winter is anticipated. Bituminous is showing indications of heaviness in all directions. Export business relieves the tension at some points. Domestic grades are steady up while steam sizes are in excess supply and weak.

BUSINESS OPINIONS

Boston News Bureau—In this country we seem to be near the point where we are going to progress far or fall back. On the outcome of the foreign loan depends the amount of our sales to the allies, for these will probably be gaged largely by the size of the loan. Loans of the present magnitude cannot be arranged without considerable detail. There are many differences of opinion which have to be adjusted, and yet the financial master minds of the world are on the job, and the result is bound to be satisfactory. Pending the negotiations now going on the country will mark time. Success of the loan will mean great prosperity in the new world. The whole industrial force of the country will be busy. People will be profitably employed.

Iron Age—With steel-making capacity so largely taken up for 1915 the trade is daily making calculations for the early months of 1916. There is more evidence that the hand of the railroads is being forced by the size of the foreign inquiry for steel to be shipped after Jan. 1. It looks now as though the railroads will all at once want a good many cars and locomotives and that they will have to take their turn after buyers who have been more forehanded. Locomotive orders and inquiries have been larger in the past week than in months. Some car requirements are shaping up. In the case of the New York Central both rails and cars are up, and rails for fall and winter delivery are expected to be placed at Buffalo.

American Wool and Cotton Reporter—Quiet but firm was the tone of the wool market for the week under review. American houses whose representatives bid at the London sales are waiting to see if permits will be issued for the exportation of wool from England to this country. The woollen goods market seems very satisfactory. Very good purchasing has taken place on some high-price lines. A favorable development in the men's wear market is the keen demand for the last week or so, for delivery of stock merchandise.

Bradstreet—Trade trends continue upward; confidence as to the future is spreading, and while holidays as well as conservatism in some quarters have not allowed full rein to trade movements, the week has provided another budget of favorable factors. Withal, conservatism is not absent, and this manifestation is seen at a number of centers where visiting buyers show a disposition to purchase frequently in relatively small lots.

Dun—All restraining influences have not been eliminated, but developments that count for most in the business world continue mainly on the constructive side. International political relations, though less threatening, still have a disquieting effect, the foreign exchange problems are as yet unsolved and dissension in the ranks of labor remains a drawback in some directions. With abundant harvests, however, a full measure of prosperity is possible, and never before was the promise of the grain crops more brilliant than at the present time.

The Southern Lumberman—The first days of September have shown no radical changes in the yellow pine market. Little price fluctuation of any kind has occurred and mills are generally adhering closely to price lists published about the first of the month. Railroad demand is again the feature of the market, though call from the retail yards, particularly in the West and South, has also increased. Greater confidence in the business of the immediate future marks the hardwood trade this week. Demand for hardwoods, while without particular features, is steadily expanding as consuming factories again come into the market preparatory to supplying their own holiday and winter trade.

Marshall Field & Co.—Wholesale distribution of dry goods is maintaining a steady volume although not as large as a year ago, at which time the anticipated scarcity of foreign merchandise was resulting in large demand for imported lines. Our retail sales are heavy, although the warm weather has been unseasonable for the sale of fall merchandise.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River continue favorable, but with no significant price movement. Panama R.R. bids the most notable recent feature. Inquiry light but export trade counted on for fall business. Georges Creek and Pennsylvania grades unchanged. Freights easy and anthracite in favorable position.

Bituminous—Little change can be reported this week in the situation of Pocahontas and New River. The Panama R.R. bids are not regarded as particularly significant in their bearing on the market. The low figures were made by shippers who are ordinarily dependent chiefly on the coastwise trade where this year the demand has been only moderate from the beginning of the season. There is a feeling, too, among the Hampton Roads shippers that some one or two of the agencies should make quotations low enough to save the tonnage for the Pocahontas and New River fields and not allow Pennsylvania shippers to get a foothold on such a comprehensive order.

Meanwhile prices f.o.b. Hampton Roads are fairly firm for both spot and deferred delivery. The various factors still take a hopeful view of fall and winter trade, although the off-shore market is expected to furnish the major part of the demand. Inquiry here is very light but that the market is generally firm is apparent in the very few concessions now made from the regular \$2.85 price.

On-car quotations are practically unchanged. Stocks are at a maximum in most directions and very few consumers are interested in the market. An occasional "market cargo" goes extremely hard and prices continue at a low range.

On Georges Creek there are no new features. The shippers are very conservative on commitments coastwise and share the expectation of other interests that the export trade will be unusually attractive. The two 8,000-ton ships being built for the Consolidation Coal Co. for Mediterranean service are soon to be put in commission.

The Pennsylvania grades are running on contract business, very little spot trade being developed. No change in prices can be reported. That some of the larger operators are actively out for comprehensive tonnages was shown in the Panama R.R. bids when Cambria coal was offered at from \$2.53@2.60 f.o.b. Philadelphia.

Water Freights still turn upon the spasmodic inquiry for coal, although 75 @ 80c. is the prevailing range on barges 2500 tons upwards. Freights from New York to Providence and Fall River are 45c., with an occasional offering at 40c.

Anthracite—There is now a fairly steady demand for what coal the companies are mining. Protracted fog along the coast has delayed the movement of barges to such extent that many New England dealers are pressing for shipments. The trade appears to be in favorable position and when cooler weather has set in there is bound to be an improved demand.

Bituminous prices at wholesale are quoted about as follows:

	Clearfields	Cambrias	Georges	Pocahontas
Mines*	\$0.90@1.40	\$1.15@1.65	\$1.67@1.77	New River
Philadelphia*	2.15@2.65	2.40@2.90	2.92@3.02	
New York*	2.45@2.95	2.70@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hanover Roads*				\$2.80@2.85
Boston*				3.58@3.78
Providence†				3.50@3.73

* F.o.b. † On cars.

NEW YORK

Anthracite dealers optimistic. Prices on individual coals stronger and dealers are apprehensive. Bituminous situation unchanged. Labor and cars short. Much interest in European situation. Demurrage coals scarce.

Anthracite—While there has been no apparent improvement in the anthracite Tidewater situation over last week, dealers are optimistic and only await the first real touch of cool weather. The warm weather of the past week caused a lull in demand and many cargoes have been held up. Prices for individual coals are a trifle stronger but still far from companies' circular.

Much interest is being taken in the demands to be made by the anthracite mine workers as a basis for the new working agreement.

Wholesale dealers report many unfilled orders on account of well-stocked bins. However, a few cool days would relieve the situation greatly. Householders are gradually returning to their city homes and retailers are showing greater activity. Collections continue slow. Some coal men say the past few

months have been the worst they have experienced in many years in that respect. The shortness of money continues to be a potent factor in the slowness of the market.

More improvement has taken place in the line trade than at Tidewater, but the demand is far from normal. Demand from New England is good.

Nut coal is a drug on the market and individual coal is easily obtainable at from 25 to 35c. off companies' circular. Egg and stove have been generally quoted at from 10 to 20c. below regular circular, but still lower prices have been heard. Demand for pea coal is on the increase and shipments continue prompt. The buckwheat grades, especially rice and barley, are moving freer and shipments are better.

Current quotations are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	\$5.05		\$5.10	
Egg	5.30	\$4.80@5.30	5.35	\$4.90@5.35
Stove	5.30	4.80@5.30	5.35	4.90@5.35
Chestnut	5.55	5.00@5.55	5.60	5.10@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.75@2.25	2.30	2.00@2.30
Barley	1.75	1.45@1.75	1.80	1.75@1.80

Bituminous—Shortage of labor and cars are the especial features of the soft-coal situation. Market conditions have improved slightly, so far as demand goes. There is not so much coal lying on the docks and some hurry-up orders have been received. However, there is plenty of coal for immediate shipment.

Interest in the demand from European countries is increasing. Exporters believe there is bound to be a shortage in the foreign markets and the American mines will be depended upon to make up the deficiency. New inquiries are being continually received and shipments are larger. Bunker requirements show improvement.

Soft-coal operators who are fortunate enough to have considerable of their output under contract are being kept busy. Large consumers are losing no time in taking their full requirements, and sometimes more. The railroads continue to store large quantities and some of the grades taken by them are practically out of the market. The car supply is tight owing to many of the smaller cars being used in the steel trade. Demurrage coal is scarce at Tidewater and there is not an oversupply of spot coals.

Current quotations are on the following basis:

	South	Port	Reading	St. George	Mine
Georges Creek Big Vein	\$3.20@3.30	\$3.20@3.30	\$3.20@3.30	\$1.75@1.85	Price
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.40	
Clearfield:					
Medium	2.65@2.80	2.55@2.65			1.10@1.25
Ordinary	2.55@2.60	2.55@2.60			1.00@1.15
Broad Top Mountain					1.10@1.45
Cambria County:					
South Forks	2.90@3.05				1.35@1.50
Nanty Glo	2.75@2.80				1.20@1.25
Barnesboro	2.65@2.70				1.10@1.15
Somerset County:					
Quemahoning		2.70@2.85	2.70@2.85	1.20@1.30	
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15	
Latrobe	2.45@2.55				.90@1.00
Greensburg	2.75@2.80				1.10@1.15
Westmoreland	3.15@3.20				1.35@1.45
West Virginia Fairmont		2.60@2.70	2.60@2.70	.80@.90	
Fairmont mine-run		2.45@2.55	2.45@2.55	.75@.85	
Steam		2.45@2.50	2.45@2.50	.90@.95	
Western Maryland		2.35@2.40	2.35@2.40	.85@.90	

PHILADELPHIA

Anthracite has relapsed back to the midsummer dullness, due to extreme heat. Prices again unsettled, especially on chestnut and pea. Individuals a growing factor. Bituminous shows gradual improvement. Good export tonnage, with tendency to higher prices.

Anthracite—The improvement noted last week has disappeared as suddenly as it came and the depression at this time is equal to the midsummer dullness. The conditions as to prices in the wholesale market are exactly the same as they were all summer. Business that was refused because of unsatisfactory prices last week is now being sought, and all the big companies report a woeful lack of orders, particularly for the local trade. The collieries were beginning to make good time, but there is not the least doubt that curtailment will take place at once.

Prices have been badly off circular, with the exception of stove, which is the popular size here and has held quite well. Egg coal, too, was fairly steady, but only because of the fact that the New England market continues to absorb a large proportion of this size. Chestnut is still the biggest problem, with no thought of anyone paying circular and with a price as low as April circular less tax on a good grade of coal. Pea also has lost the little strength it had last week, with offerings of any quantity of excellent coal at \$1.85, and in several instances quotations as low as \$1.65 have been noted.

The steam sizes are in plentiful supply, with buckwheat well taken care of. The other grades, however, especially rice, are very heavy, immense quantities going into the already large tonnage in storage. It is known that several of the larger companies are going to make special efforts this coming season to push the consumption of rice as a steam fuel in competition with bituminous. Collections are very slow, if anything more so than at any time during the summer.

The retail dealers are not asking the regular winter schedule for coal, as has been the usual custom at this time, but are offering deliveries at from 25c. to 50c. from the usual prices. The larger dealers, however, are asking the full winter prices and are extensively advertising their prices in the daily papers. The prices maintained by the larger companies, to which should be added the Pennsylvania state tax of 2½%, are as follows:

	Line	Tide		Line	Tide
Broken.....	\$3.50	\$4.75	Pea.....	\$2.50	\$3.25
Egg.....	3.75	5.00	Buckwheat.....	1.25	2.25
Stove.....	4.00	5.00	Rice.....	.85	1.75
Chestnut.....	4.15	5.25	Barley.....	.50	1.50

Bituminous—The improvement noted last week continues in most quarters. There is no spurt, but the betterment is gradual, indicating that it will be continuous along with the constantly improving industrial situation. As evidence of this the Pennsylvania R.R. reports that every car in good repair is now in service, and all the railroads are showing an increased bituminous tonnage. The car supply continues to be a factor, although not as yet serious. There have been no important price changes during the week, although large shipments to Lake ports still have a tendency to make all slack grades strong. The export business continues in good volume, with inquiries up to the average of last month, and there also seems to be a tendency to get a better price on new orders. Vessel tonnage is still unable to meet the demand, with the result that a number of clearances have recently been made of sailing vessels for trans-Atlantic ports.

The price situation is well represented by the following average quotations current this week:

Georges Creek Big Vein..	\$1.65@1.75	Fairmont gas, ¹	\$1.20@1.30
South Fork Miller Vein..	1.50@1.60	Fairmont gas, mine-run..	1.05@1.15
Clearfield (ordinary).....	1.00@1.20	Fairmont gas, slack.....	.70@.80
Somerset (ordinary).....	1.00@1.15	Fairmont lump, ordinary.	.90@1.00
West Va. Freeport.....	.85@.95	Fairmont mine-run.....	.85@.90
		Fairmont slack.....	.60@.70

BALTIMORE

Bituminous market steady with indications for a good fall and winter trade.

From all bituminous sources came encouraging reports. Production is now only about keeping up with demand, and surplus stocks have generally been eliminated. Everybody is now looking for a good fall and winter term. Prices have held firm during the week with little or no change from the previous week.

There was a meeting here of about 18 of the Fairmont district operators this week to discuss the proposed increase of rates from West Virginia, Ohio and Kentucky to the Northwest. The operators are preparing to fight the plan before the Interstate Commerce Commission.

Vessels are scarce for use in the export trade. A number of shippers are complaining that many cargoes are being delayed on this account.

HAMPTON ROADS

Shipments foreign continue heavy. Government takings fair. Prices Unchanged.

The movement from Hampton Roads ports for the week has shown up well. The export shipments have been principally to various Italian ports although some fair-sized cargoes have gone to South America. Practically all of the coal going foreign has been New River and Pocahontas mine-run, while that shipped coastwise has consisted of mine-run, nut and slack and high volatile although the movement of the latter has not been very heavy. Coastwise shipments have been to Boston, Providence, Fall River, Portland, Pawtucket, Bangor, Everett and other New England ports with one cargo of 7500 tons for San Francisco.

There is no change in circular prices. There is some accumulation of coal in the local yards quite a number of the large shippers are short and have some difficulty getting coal forward fast enough to take care of vessel tonnage already contracted for. The number of steamers calling for bunker coal is still below the normal but the movement is holding up well as practically all of the steamers loading coal and grain cargoes are taking sufficient bunkers for the round trip. The quantities vary according to the size of the steamers, some vessels taking as low as 300 tons and under while others take 2000 tons and over.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending				
	Aug. 14	Aug. 21	Aug. 28	Sept. 4	Sept. 11
Norfolk & Western....	171,252	172,546	211,699	232,394	156,759
Chesapeake & Ohio....	83,390	129,826	103,472	82,485	14,980
Virginian.....	63,066	77,136	82,131	72,302	70,855
Totals.....	317,708	379,508	397,302	387,182	241,994

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

BALTIMORE—Continued

Vessel	To	Tons	Rate	Vessel	To	Tons	Rate
Jacksonville	Bermuda	547		Sonora	Cienfuegos	1,186	
I. Tunell	Cay			Claveresk	Felton	2,441	
E. B. Douglass	Francis	1,118	3.00	Ubbergen	Tela ¹		
D. W. B.	Charleston	910	1.10	Gustav Adolf	Malmö	1,847	
S.H. Davidson	St. John	96	1.60	Shawmut	Mayport	1,100	
Maud	Bath	482	1.00	Musner	Palermo	2,082	
Thorsa	St. John	1,351		' And Trixilio.			
	Sagua	683					

VIRGINIA

BALTIMORE	G. Accame	Italy	1,980	10.08
Trento	Leghorn	2,089	St. Lucia	2,231
St. John	Gothenburg	1,519	Rio	
Bellatrix	Port		Janeiro	1,457 7.50
	Limon	1,629	Savannah	985 1.15
	Callao	1,951	Pernambuco	758 6.50

VESSEL CLEARANCES

The following steamers have cleared from various ports Sept. 3 to Sept. 10:

NORFOLK

NEWPORT NEWS—Continued

Vessel	Destination	Tons	Vessel	Destination	Tons
Accame ¹	Torre Annunziata	5,850	Maritime ¹⁰	San Francisco	7,500
Kanaris	Leghorn	5,532	Homer City ⁷	W. C. Italy	5,400
Chariton ²	Piraeus	4,704	Miguel Jover ⁷	Maddalena	3,500
Copenhagen	Talal	6,482	Mayaro ⁷		1,400
Corbridge ³	Buenos Aires Rds	5,500			
Cheniston ¹	Genoa	6,400	Trenti	Italy	4,917
Mt. Vernon ³	Sagua	984	Senora	Cuba	2,115
Queenswood ³	Rio Grande do Su	3,246	Enricken	Brazil	2,659
Hermon ³	Rio de Janeiro	7,287	Luisa	Spain	4,673
Brendon ¹	Dakar	6,700	Bellatriz	Costa Rica	3,469
Marte ⁴	Maddalena	5,026	Luygino Acme	Italy	3,951
Tabor ⁵	Canal Zone	5,000	Velgier	France	7,319
Wellington ⁶	Guaymas	8,320	Warren	Argentina	4,300
Sliedrecht ³	Bahia	4,116	Raura	Peru	4,000
Parana ¹	Rio de Janeiro	5,135	Erinier	France	6,046
Doonholm ⁴	Spezia	7,018	Scherie	Italy	3,100
Torrington ¹	Leghorn	7,700	Joannis Vatis	Italy	5,800
Radcliffe	Genoa	8,792	Angelo	Italy	4,700
Letizia ⁴	Naples	2,175	St. John	Sweden	4,500
Accame	Genoa	3,722	Claveresk	Cuba	6,100
Pierce ³	Rio de Janeiro	5,518	Byrd Hopkins	Venezuela	337
			Anakonda	Argentina	1,500
			Gustaf Adolph	Sweden	4,700

NEWPORT NEWS

Ganitoise ⁴	Buenos Aires	4,520	* Poehontas Fue Co.	* Castner
Antonio ⁷	Santiago de Cuba	1,500	Curran & Bullitt.	* Smokeless Fuel Co.
Parodi ⁸	Spezia	5,600	* C. & O. Coal Agey Co.	* Wm. Atwater Co.
Tancred ⁷	St. Lucia	5,500	* Flat Top F. Co.	* Berwind White C.M. Co.
Chulmeigh ⁹		5,800	* New River Coal Co.	* W. Va. Coal Co.

OCEAN FREIGHTS

The freight market is considerably firmer than a week ago owing to the absorption of vessels and continued demand from the grain trade. Cotton orders are also appearing in the market, and a few characters have been effected for cotton at high rates. But few steamers were closed for export coal during the past week and none of these characters were reported.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana.....	\$2.50@2.75	Bermuda.....	\$3.00
Cardenas or Sagua.....	2.75@3.00	Vera Cruz.....	3.50@3.75
Cienfuegos.....	3.00@3.50	Tampico.....	3.50@3.75
Port au Spain, Trinidad.....	3.00	Rio.....	8.04@8.15
St. Lucia.....	3.50@3.75	Santos [*]	8.16@8.45
St. Thomas.....	3.00@3.25	Montevideo.....	8.04
Barbados.....	3.75	Buenos Aires or La Plata	8.16
Kingston.....	2.75@3.25	Rosario.....	8.40
Curacao.....	3.25	West Coast of Italy.....	10.20
Santiago.....	2.75@3.25	Barcelona**.....	9.60
Guantanamo.....	2.75@3.25	Valparaiso or Callao.....	7.00@7.50
Demerara.....	5.00	Marseilles.....	9.60@9.84

Note—Rates noted in bold face type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Steel industry consumes record tonnage of coal. Lake shipments now satisfactory. Prices show further stiffening. Operations at 60 to 70% of capacity.

The steel mills of the Pittsburgh and surrounding districts are producing and finishing more steel than ever before in their history, and their coal consumption is undoubtedly at a record rate. One branch of the finished steel trade which is a large consumer of coal in proportion to the tonnage output, the sheet branch, is far from busy at present, the sheet mills only operating at from 60 to 75% of capacity, but other finishing lines are working up correspondingly more steel. Railroad demand has increased somewhat and is now practically normal. It has been reported lately that the Pennsylvania R.R. has put into service all its idle cars, and conditions on the Baltimore & Ohio and Pittsburgh & Lake Erie are somewhat similar.

Coal demand from retail dealers has not been good the past week or ten days, and not even up to normal for the season, as the weather has been exceptionally warm.

Lake shipments are now quite satisfactory and a normal movement to the close of the season is expected, with perhaps some pressure upon the transportation facilities. The season's total, however, will be small.

Coal prices have stiffened still further, and in particular there is more disposition to ask higher prices on contracts to Apr. 1. There is reason to expect the miners to demand a very considerable advance, for the biennial period beginning Apr. 1, such a demand as would result in a considerable suspension of mining and a sharp demand for coal preceding Apr. 1.

Mine operations in the Pittsburgh district are between 60 and 70% of capacity, on an average, with occasional reports of car shortages.

Prices for free coal are firmly held at the following minimum quotations: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@\$1; mine-run, \$1@1.05; $\frac{3}{4}$ -in., \$1.10@1.15; 1 $\frac{1}{4}$ -in., \$1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 the market is firm at 85@95c. for slack, \$1.15@1.20 for mine-run, \$1.25@1.30 for $\frac{3}{4}$ -in. and \$1.35@1.40 for 1 $\frac{1}{4}$ -in.

BUFFALO

Bituminous moving a little faster. Prices fairly strong. Prospect of a good fall and winter trade. Anthracite not stirring much yet.

Bituminous—The trade is much encouraged. All sizes, including slack, are strong and the prospect is for a steady though rather slow improvement till the average movement is reached. The main difficulty is that there is sure to be an output that will keep pace with the demand, and this will hold prices down to about the present level till some emergency appears. The expected emergency is a shortage of cars. There are already reports of a scarcity and some sections of the Pennsylvania bituminous mines are already on an allotment basis. The railroads have taken the alarm and both the bituminous and the anthracite roads are stocking considerable coal.

Reports from Canada are not reassuring. Business remains dull and the factories especially are not active. There is a sort of war paralysis over the entire land that bids fair to continue till the war is ended, or there is a decided turn for the better. It was a mistake to put up the tariff on coal there, as it has only tended to cut down business. The peculiar condition of the money market there has also made collections difficult. Not a few business men who were not doing well closed up their affairs and went into the army, sometimes leaving their debts unpaid.

The prices of bituminous grow stronger week by week. Slack is doing especially well, considering the time of the year. Quotations remain on a basis of \$2.65 for best Pittsburgh lump, \$2.50 for three-quarter, \$2.40 for mine-run and \$2.05 for slack. The price of Allegheny Valley coal is about 25c. lower than Pittsburgh.

Anthracite—The fall trade has not yet set in and the slow movement by Lake shows that the reported increased activity at Upper-Lake ports cannot be heavy. The companies appear anxious to get more coal distributed before the late fall rush and they are laying down a surplus wherever they find a convenient stocking ground. The Lake shipping agents are doing what they can to fill in any gaps on the Upper-Lake docks and will continue to do so till the Lake season closes. A report from Oswego states that after a period of light shipments the port has resumed a normal movement.

The amount of anthracite shipped from Buffalo by Lake is not heavy, being for the week only 85,000 tons. It is not common to fall below 100,000 tons during the full season. The anthracite prices have now resumed the winter maximum as follows, f.o.b. cars at Buffalo: \$5.60 for grate, \$5.85 for egg and stove, \$6.10 for chestnut and \$4.30 for pea, with 25c. extra for delivering on board Lake vessels.

TORONTO, CAN.

The usual fall advance in the price of anthracite was announced on the first of the month. Business was brisk for a week or so before the rise, but has slackened considerably since, and is likely to remain quiet until cooler weather sets in. The yards are well stocked and consignments are coming in freely. Quotations for best grades are as follows: Retail, anthracite, egg, stove and nut, \$7.75; grate, \$7.50; pea, \$6.50; bituminous, retail, steam, \$5.25; screenings, \$4.25 to \$4.50; domestic lump, \$6; cannel, \$8. Wholesale, f.o.b. cars, three-quarter lump, \$3.56; screenings, \$3.

COLUMBUS

Warmer weather has an adverse effect on the domestic trade. Steam business is still rather active and prices well maintained. Rural dealers buying more freely.

The warmer weather of the past week has had a rather bad effect on the domestic business. Dealers who were laying in stocks have stopped their shipments for the time being and there is a slight lull. This is believed to be temporary only, as retailers' stocks are light and dealers must lay in supplies for the winter's business.

Steam business is continuing rather active and reports show that manufacturing is still increasing. Large war orders have been placed and coal is needed for power purposes. Railroads are still stocking up large quantities to guard against strikes or other untoward circumstances. Contracting is more active and quite a few contracts are expiring at this time. There is scarcely any demurrage coal on the local market.

Prices throughout the list are holding firmly, especially on the domestic sizes. Anthracite is also moving well. Considerable Hocking lump is being stocked for the winter. Retail business is a little slow because of the warmer weather, but contracting for school supplies is going on rapidly. Rural dealers are now buying better as farmers have completed their harvesting and have time to haul their fuel supply.

The Lake trade is rather active as shippers want to rush as large a tonnage as possible to the head of the Lakes before the close of navigation. Lake prices are unchanged. Reports from the Northwest indicate that the interior movement is larger. The Toledo docks of the Hocking Valley Ry. have been busy during the week loading Lake steamers.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump.....	\$1.50	\$1.50		
Inch and a quarter.....	1.40	1.40	\$1.30	\$1.30
Three-quarter inch.....	1.25	1.25		1.25
Nut.....	1.15	1.25		1.15
Mine-run.....	1.05	1.10	1.00	1.05
Nut, pea and slack.....	.65	.70	.55	.65
Coarse slack.....	.55	.60	.45	.55

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Aug. 21	Aug. 28	Sept. 4	Sept. 11		Aug. 21	Aug. 28	Sept. 4	Sept. 11
Hocking....	30	35	45	40	Cambridge.	35	35	40	44
Jackson....	20	20	20	25	Massillon..	30	50	40	40
Pomeroy....	40	45	50	50	Eastern O.	55	55	60	60
Crooksville.	30	30	35	35	Average..	33	34	41	42

CLEVELAND

Prices on fine coal are stiffening. Car shortage being felt. Lake coal prices firmer and higher.

Excepting Fairmount lump and mine-run the local market is supplied with all other coals quoted. There is not a great deal of coal on track and slack is from 5 to 10c. a ton higher than a week ago. How much of this is due to the idleness of the mines early last week cannot be determined until the shipments are back to normal. All of the Ohio and Pennsylvania mines lost from one day to a day and a half through car shortage last week and will lose as much this week.

There is a stronger tone to the Lake coal market. Youghiogheny coal, which has been sold at \$1.95 with \$2 high at the docks, is now held by many shippers at \$2 to \$2.05. Shippers in Ohio are also holding their coal at higher prices in about the same proportion. August weather prevailed the first of the week and the high temperature held up the domestic trade. Deliveries are being made on orders placed some days ago, but the trade continues to act slowly in laying in the winter supply.

The Lake business is showing material improvement and cargoes are coming forward somewhat better. The grain that has been threshed is slow in arriving at the upper ports and receipts have been practically half as large as a year ago. This has tended to hold back the coal shipments from upper Lake docks. Large receipts of grain are expected next week at Duluth-Superior and coal shipments will increase rapidly thenceforth.

Quotations to jobbers are as follows:

	Poca-hontas	Youghio-gheny	Fair-mount	Berg-holz	Ohio No. 8
Lump.....	\$3.70			\$2.30	
Lump, 6-in.....				2.30	
Lump, 1½-in.....		\$2.25		2.10	\$2.15
Lump, 4-in.....		2.15@2.20	\$2.00	2.00	1.95@2.00
Egg.....	3.70			1.95	
Mine run.....	2.70	2.10@2.15	1.90	1.85	1.85
Slack.....		1.65	1.65	1.55	1.60

DETROIT

Broader market develops for steam coal. Prices continue to firm up. Domestic coal more active in retail trade. Anthracite distribution well under way. Lake transportation still curtailed.

Bituminous—Increasing optimism is noted among Detroit coal shippers, with a continuance of the favorable conditions affecting the steam-coal market, and numerous orders are being booked. Although almost all these orders cover small consignments, the repetition of these suggests a more satisfactory condition. Another encouraging feature is a greater activity of manufacturing establishments and a broader demand for steam coal. There has also been a reduction in the amount of consignment coal here. There is still much of this stock available, but the better condition of the market perverses any large tonnages from being offered at sacrifice prices.

West Virginia gas and splint three-quarter lump hold well at \$1.10, while nut, pea and slack range from 55 to 65c. for lower grades to 75 and 90c. for more desirable qualities. Smokeless lump and egg are quoted at \$2.25, nut at \$1.75 and mine-run at \$1.25, all quite firm. Hocking domestic lump is now bringing \$1.35, three-quarter lump \$1.25 and upward, with mine-run at 70 to 80c. These are all mine prices, lower figures being still occasionally available on sale to avoid demurrage.

Anthracite—Orders to shippers are not in large volume, the present season, following the termination of discounts, developing only limited business until stocks of retail yards have been reduced. The distribution to consumers is in progress and with the prospect of the customary winter advance of 50c. a ton the first of next month, buyers are beginning to awaken to the necessity of action. A slightly better movement from the Upper Lake docks is reflected in a freer movement of coal over the Lake route. Shipments are still far short of normal volume at this season, and even many freighters having season contracts are forced to make the upbound trip without cargoes.

CINCINNATI

Price concessions and a slow demand are keeping the domestic market dull. Some improvement in the steam trade.

Reports agree that most of the retail trade is either well stocked with bargain coal or is now receiving deliveries of fuel purchased at low prices during the spring and summer. Price concessions are still noted but have had the opposite effect from that of stimulating business. Buyers are now firmly convinced that they can get their supplies at abnormally low prices at any time.

The steam market is also very dull, but the coke market is active. Wholesale handlers of coal are far from optimistic just now, however, the general feeling being that only cold weather can help much.

LOUISVILLE

Market holds the recent improvement and consumers are beginning to cover their requirements. Car shortage already felt.

The market continues to hold firm and the optimistic feeling is still in evidence. Inquiries are numerous and the mines are selling enough coal for immediate delivery to bring about a car shortage, which was distinctly felt on the Louisville & Nashville lines for several days. One of the best indications of the improvement is the disposition of large steam coal users to contract. They have been taking advantage of the low prices, but now they are getting under cover, realizing that the market is definitely stronger and that prices are on the up-grade. Quotations are practically unchanged on eastern Kentucky coal, block bringing \$1.50 to \$1.75, with fancy grades at from \$1.90 to \$2. Slack is worth 60c. for immediate delivery, but contract business is being booked regularly around 70c.

COKE

CONNELLSVILLE

Reports of furnace coke contracts for first half 1916. Sliding scale contracts preferred. Prompt furnace coke still weak while foundry coke is stronger. Production and shipments slightly decreased.

Unconfirmed reports are that two or three furnace-coke contracts have been made, for deliveries over the first half of 1916, on the basis of \$1.75 for coke when basic pig iron is \$13.75, valley, or less, with 5c. advance in coke for every 25c. advance in pig iron, prices to be adjusted monthly. While it is not positively known that such contracts have been closed it is known that some operators would be willing to sell on this basis. There are rumors that one or two furnace interests have closed on an even higher basis, for the reason that the furnaces are not in blast and it is not known certainly that they will take full deliveries.

There is considerable negotiation for furnace coke for the first half of the new year, and both buyers and sellers seem to prefer a sliding-scale basis, but the negotiations are protracted as there is much discussion of ratios. Some of the furnaces seem willing to concede a great deal to the sellers, in the event of high pig-iron prices, provided they are given corresponding concessions when pig iron is relatively low.

Furnace coke for prompt shipment continues in light demand, and while there is not much unsold coke on track there seems to be enough to prevent the spot market from reflecting the prices the operators demand for forward shipment.

Demand for foundry coke continues fair, with prices slightly higher. We quote: Prompt furnace, \$1.60@1.65; furnace, September, \$1.75; furnace, to Jan. 1, \$2; prompt foundry, \$2.30@2.60; contract foundry, \$2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 4 at 379,935 tons, a decrease of 2,671 tons, and shipments at 380,631 tons, a decrease of 7,476 tons.

Buffalo—There are shippers who claim to be getting better prices for foundry coke than the regular quotations, but as a rule the trade finds \$4.30 for best 72-hr. Connellsville foundry quite high enough, with stock coke \$3.35. The former strength and activity continue and the movement of both ore and pig iron in this market appears to warrant prices on this basis. Lake receipts of ore at Buffalo for the week were 217,000 gross tons, a much larger amount than formerly.

MIDDLE WESTERN

DULUTH

Cooler weather would have a tendency to stimulate the market. Slow grain movement delaying the coal trade.

Bituminous—Dock companies have been doing only a fair volume of business during the past week, nor is any great increase in shipments looked for until cooler weather prevails. Another factor tending to retard shipments is that the grain-handling season is about two weeks later than usual, so that the customary "fall rush" of orders from the grain elevator lines engaged in the retailing of coal are not expected to appear until the middle or latter part of September.

Some wavering in prices for domestic grades to the country dealers has been noted, but on the whole the circular list has been fairly well maintained. Circular price lists issued by the dock companies, effective Sept. 1, are as follows:

	Youghiogheny	Hocking	Splint	Smokeless
Lump.....	\$3.40	\$3.40	\$3.40	\$4.75
Dock run.....	3.10	3.05	3.10	3.25
Screenings.....	2.40	2.25	2.40	2.75

Anthracite—There was the usual monthly advance of 10c. per ton on Sept. 1, this being the last advance of this kind for the year. The movement of anthracite to the country is about normal, although a little cooler weather would be some incentive for the dealers to stock up. Egg and stove sizes are quoted at \$6.85, nut \$7.10 and pea \$5.55, f.o.b. cars at the docks.

ST. LOUIS

Situation good with prices steady but orders less plentiful. Screening inclined to be heavy. High-grade coals moving freely.

Trade conditions are good. Prices are keeping up on domestic sizes and screenings are in fair demand but slightly weaker. The buying, however, has not been as brisk on account of a few days of warm weather, which is also felt by

the dealers, who report they have plenty of orders but they are not coming in as fast now as a few days ago.

The car situation is some better and orders for Williamson and Franklin County coal are now being filled that were taken in the latter part of August.

The demand for high-grade soft coal is sharp, showing much improvement over the past few weeks. The supply is normal and the dealers are making excellent deliveries. With the increased demand has come an advance in price and the market is considered firm at the new figures. While the higher grades are showing improvement, it is noted that the "inner group" is suffering from a lack of demand. These mines produce the greater part of the low-grade coal used in this city and the lack of work among the wage earners has prevented them from paying for their last year's coal. As a result a great amount of the cheap coal business will be done this winter in small lots, for cash and as needed. The present circumstances of the wage earners, however, are much improved and the coal dealers are not looking for a distress season.

The market is quotable as follows:

	Staunton	Collinsville	Sparta	Standard
6-in. lump	\$1.35@1.50	\$1.20@1.35	\$1.15@1.25	\$1.15@1.20
3 x 6 egg.	1.15@1.30	1.10@1.25	1.00@1.10	.90@1.00
2-in. lump		1.15@1.20	1.05@1.10	.95@1.00
No. 1 nut				.75@ .85
No. 2 nut				.60@ .70
No. 1 washed	1.50	1.30@1.35		
No. 2 washed	1.25@1.35	1.25		
No. 3 washed	1.20	1.15		
No. 4 washed	1.15	1.10		
No. 5 washed	.70	.65@ .70		
S reenings			.50	.45@ .50

The rate from inner group mines is 57½c. per ton to St. Louis and 25½c. per ton less to East St. Louis. For beyond St. Louis the rate to East St. Louis is 25c. per ton.

KANSAS CITY

The retail trade in Kansas City has been increasing and prices are from 25 to 75c. over those of a few months ago. The dealers have commenced to open their yards for the winter trade and much coal has arrived from the mines. The wholesale market has been a little better than for some time. Prices on semianthracite are still 25c. in advance of a month ago.

PORLTAND, ORE.

No Pennsylvania anthracite will be shipped here the coming season, it is said, because of the prohibitive water transportation rates and scarcity of vessels. Last winter it was hoped that coal could be laid down here from Pennsylvania at a figure that would permit its sale at \$12 per ton, but this is quite out of the question now. Some anthracite is being brought in from Alberta, and it is said to meet with fair satisfaction. The coal sells here for \$12.25 per ton, chestnut size, and \$13.75 egg size.

It is said some Wellington coal may be brought here the coming fall from Vancouver Island mines, and the freight would permit it selling possibly at 50c. less per ton than the Utah coal.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Anthracite shipments for August and the first eight months of 1914-15 were as follows:

	August		8 Months	
	1915	1914	1915	1914
Penn. & Reading	847,262	904,643	7,100,087	7,768,256
High Valley	1,029,721	1,079,172	8,354,180	8,260,472
Cent. R.R. of N.J.	613,721	637,467	5,010,562	5,735,445
Del. Lack. & West	859,368	819,848	5,970,751	6,245,125
Del. & Hudson	731,137	619,062	5,232,732	4,706,619
Pennsylvania	426,818	497,579	3,766,322	4,121,427
Allegheny	690,817	734,350	5,097,909	5,441,578
Cent. & Western	131,987	191,622	1,327,797	1,542,467
	5,330,831	5,483,743	41,860,340	43,321,389

Stocks at Tidewater Aug. 31 were 653,496 tons.

THE CAR SUPPLY

The American Railway Association reports a surplus of 10,919 coal and gondola cars, and a shortage of 2,332 cars on Sept. 1. The gross shortage of all cars was 6,260, which compares with 948 on Aug. 1 and 1,913 on Sept. 1 of last year.

LAKE SHIPMENTS

The movement of coal through the Sault Ste. Marie Canal for August of the current year amounted to 2,050,960 short tons, of which 279,948 tons were anthracite, and 1,771,012 tons bituminous.

BITUMINOUS COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during June and the first six months of the last two years, in short tons:

	June		6 Months	
	1914	1915	1914	1915
Baltimore & Ohio ¹	78,019	79,766	711,784	606,594
Chesapeake & Ohio ¹	1,669	1,358	7,893	6,348
Erie ²	826,756	776,260	4,468,839	4,196,731
Pennsylvania ³	855,247	843,053	5,654,277	5,423,467
Virginian ¹	84			342
Total 5 roads	1,761,775	1,700,437	10,842,929	10,233,482
Bituminous				
Baltimore & Ohio ¹	2,517,909	3,051,305	16,234,637	14,781,587
Buffalo, Roch. & P. ¹	552,867	622,873	3,862,002	3,635,333
Buffalo & Susq. ¹	70,537	72,647	561,309	510,476
Chesapeake & Ohio ¹	1,822,962	2,024,639	9,672,008	10,118,056
Erie ³	7,443	5,340	40,126	50,668
Hunt. & Br'd T. Mt. ¹	62,416	66,151	258,635	45,927
New York Central ¹	604,937	683,677	3,923,543	4,184,311
Norfolk & Western ¹	2,315,956	2,713,277	12,516,321	12,761,153
Pennsylvania ¹	3,897,544	3,664,703	23,555,182	20,261,777
Pitts. & Lake Erie ¹	975,158	998,200	5,457,907	4,337,453
Pitts. Shaw. & North ¹	181,711	162,406	1,198,520	1,062,139
Virginian ¹	321,181	301,932	2,027,720	1,898,671
Western Maryland	225,057	260,653	1,526,849	1,604,677
Total 13 roads	13,555,678	14,627,803	81,104,759	75,666,228
Coke				
Baltimore & Ohio ¹	298,237	329,130	1,839,861	1,627,001
Buffalo, Roch. & P. ¹	24,207	34,264	142,604	201,067
Buffalo & Susq. ¹	35,294	49,515	164,803	293,728
Chesapeake & Ohio ¹	29,392	22,701	207,755	110,044
Norfolk & Western ¹	87,921	77,528	580,668	444,294
Pennsylvania ¹	793,763	990,476	5,227,885	4,998,919
Pitts. & Lake Erie ¹	394,508	446,126	2,693,577	2,237,156
Western Maryland	4,001	4,097	38,505	21,586
Total 8 roads	1,667,023	1,953,837	10,895,658	9,933,795
Total Coal and Coke 13 Roads	1914	1915	connecting lines.	
January	18,157,998	15,685,798		
February	15,446,830	13,702,789		
March	20,233,213	14,943,124		
April	15,497,444	16,070,049		
May	16,523,385	17,149,668		
June	16,984,476	18,282,077		
Total, 6 months	102,843,346	95,833,505		

Note.—The Southern Railway hauled 234,712 short tons of bituminous coal during May, 1915, and 1,328,516 short tons during the five months ending May 31.

I. C. C. DECISIONS

I. C. C. No. 7983—In the matter of rates, divisions, rules, regulations and practices governing the transportation of railroad fuel and other coal.

1. The character of a shipment and not formal incidents, such as billing, determines the rate and divisions applicable. The rates and divisions to points of actual destination must be applied to railway fuel coal shipments here involved, and the application of rates and divisions to fictitious billed destinations is unlawful and can not be justified by the theory that such rates and divisions would be proper rates and divisions to the average point of actual destination.

2. A railroad company as shipper is entitled to the same consideration as any commercial shipper and no more, even when the shipment moves in part over the rails of such railroad company. It follows that in such case the carrier is entitled to a division of the joint through rate. But the division must be fixed by the same considerations which would determine divisions upon a through commercial shipment in which the railroad had no interest other than that of carrier. The divisions now received out of the joint rate on supply coal by the Seaboard Air Line, the Atlantic Coast Line, and the Charleston & Western Carolina Railway Co. for the hauls from their junctions are special and abnormal divisions.

3. The Commission may fix divisions when a railroad company is the shipper or is owned by the shipper so that the division of a through rate might be the means of indirectly reducing transportation charges or effecting discriminations. Divisions here involved will not be fixed by order at this time, but carriers will be expected to adjust them to meet views herein expressed.

4. The Commission may order that such divisions be filed with it and it is so ordered as to the divisions applicable to fuel coal shipments herein involved.

I. C. C. No. 4806—Plymouth Coal Co. vs. Lehigh Valley R.R. Co.

Reparation awarded on account of unreasonable rates charged for the transportation of anthracite coal from Luzerne, Penn., to Perth Amboy, N. J., for trans-shipment.

Financial Department

Pittsburgh Coal Co.

This company reports, in part, for the year ended Dec. 31, 1914, as follows:

Earnings—The gross earnings from all sources were \$4,201,070 (a decrease of \$2,220,632, or 34.58%); and the net surplus earnings, after all charges and usual depreciation, were \$1,371,058 (a decrease of \$1,355,210, or 49.71%), being in excess of 5% on the preferred stock outstanding.

Tonnage—The total tonnage produced and handled, including coke (but exclusive of coal purchased and handled direct by subsidiary companies) was 18,295,851 net tons (a decrease of 6,411,353 net tons, or 25.95%).

Productive capacity used was about 54%. The number and use of mining plants in all fields were: working all or part of year, 71; abandoned, 7; available but idle, 6; leased, 7; total, 91. Unsettled mining conditions and substitution of West Virginia coal were the main causes of practically five months' idleness in the Ohio mines.

There was an average increase in cost of 0.49c. and a decrease in sales value of 2.51c. per ton. The Monongahela River Consol. Coal & Coke Co. had no opportunity the greater portion of the year to move its product to take care of its down-river trade. The iron and steel industry, which takes a material portion of its output, was much depressed most of the year.

Trade Conditions—Trade conditions were adverse all the year and became unprecedented during the last half-year because of foreign hostilities. Owing to excessive competition, upsetting both costs and sales values, it was difficult to secure favorable results. A large tonnage loss was made in Lake cargo and fuel business, to the advantage of the West Virginia fields, which show an increase for the year. Our representatives were sent to South America, but found no shipping facilities to compete with the present sources of supply.

Acquisition—The property and mines formerly owned by the Illinois Collieries Co. were acquired under mortgage foreclosure and are now operated under the name of the Montour Coal Co. of Illinois.

Montour R.R.—This railroad has been completed and is now in operation, its substantial construction insuring a minimum of maintenance expense. The cost of construction was increased above the amount estimated only by the practical elimination of all grade crossings, and for right of way. The three new mines which, under existing contracts, we were obligated to open during the year, are now in service and ready to develop trade.

Railroad Lake Freight Rate—The effort of the carriers to increase coal rates and especially the Lake cargo rate from the Pittsburgh District, was not successful, and they remain the same as before the tariffs of October, 1913 were filed, without elimination of any of the existing discrimination.

Sale of Property to M. R. C. C. & C. Co.—Since Dec. 31, 1914, a sale of 10,859 acres of coal rights, including 375 acres of surface owned and improvements thereon, has been made to The Monongahela River Consol. Coal & Coke Co. (the stock of which is practically owned by this company) at an average of \$812 per acre for the coal and aggregating \$8,822,717.

The funds for this payment were chiefly derived from the sale of property made by that company in 1911 and interest increment since that time, which has been held by The Union Trust Co. of Pittsburgh, as trustee under that company's mortgage of 1899, applicable under its terms for the purchase of additional property or for the retirement of bonds issued under it, \$6,323,000 now outstanding. This transfer will increase the coal acreage of the Monongahela Co. to approximately 26,000 acres, upon which the bonded debt, taking into account the bond sinking fund credit, will be less than \$230 per acre.

Retirement of Bonds—With the proceeds of this sale it is proposed to retire the \$8,011,000 bonds of the Pittsburgh Coal Co. of Pennsylvania by call for payment on July 1, 1915.

After payment of these bonds our total funded debt, including the obligations of all the subsidiary companies, will be \$141.62 per acre, based on a total ownership of 148,283 acres of unmined Pittsburgh vein coal, exclusive of improvements, with all other assets free.

Benefit of This Bond Payment—This transaction will effect an annual saving of about \$400,000 in bond interest, and also stop the drain on working capital of about \$700,000 annually for bond principal retirement. Also through the release of the stock of the Pittsburgh Coal Co. of Pennsylvania, now pledged under the mortgage, an earlier adjustment of the dividend arrearage upon the Pittsburgh Coal Co. of N. J. preferred stock outstanding will be made possible. Furthermore, by giving up the charter of the latter company, there will be a further material saving.

Outlook for 1915—Until the depressing influences are lessened through settlement of foreign troubles and domestic affairs, no great or sustained improvement is to be expected in the trade conditions in this district, but the expected release from large interest and other overhead charges gives a reasonable assurance that our company will be able to maintain itself with results to its shareholders.

Note—For previous annual report of this company see Vol. 6, p. 92.

Elk Horn Fuel Co.

This company reports for the year ended Dec. 31, 1914 as follows:

INCOME ACCOUNT FOR YEAR ENDING DEC. 31, 1914

Earnings (all sources)	\$434,320	Net income to surplus.....	\$221,087
Expenses.....	14,733	Surplus Dec. 31, 1913.....	1,179,780
Interest on 1st M. notes....	198,500	Total.....	\$1,400,867

Preferred dividends..... 340,720

Net income to surplus.... \$221,087 Surplus Dec. 31, 1914..... \$1,060,147

COMBINED GENERAL BALANCE SHEET DECEMBER 31

Assets	1914	1913	Liabilities	1914	1913
	\$	\$		\$	\$
Real est. & coal lands.....	25,197,462	23,482,104	Common stock.....	19,000,000	19,000,000
Plant and equipment, a.....	800,000	.....	Preferred stock.....	7,000,000	7,000,000
*Stocks of other companies.....	7,298,390	7,298,390	1st M. notes.....	3,970,000	3,970,000
Notes E. H. M. cor.....	2,475,000	.....	Note issue.....	2,475,000	.....
Adv. to sub. cos.....	39,007	35,312	Min. F. Co. stock.....	1,200,000	.....
Def. debit items.....	20,083	.....	bds.....	1,200,000	.....
Cash.....	244,550	81,814	Unpaid vouchers.....	47,193	80,896
Demand loans.....	.....	335,081	Pay-rolls.....	.....	12,294
Accr. divs. other cos. paid Jan. 31, 1915.....	.....	43,715	Accr. int. on notes.....	37,042	33,083
Treasury stock.....	b315,046	.....	Accounts payable.....	994	2,506
Supplies, etc.....	.....	18,590	Bills payable.....	341,298	.....
Miscellaneous.....	6,004	7,186	Dividend Jan. 15.....	87,500	.....
Total.....	36,419,174	31,278,560	Surplus.....	1,060,147	1,179,780
			Total.....	36,419,174	31,278,560

* Include 43,715 shares Consolidation Coal Co., 12,000 shares Mineral Fuel Co., 7,879 shares Beaver Creek Consol. Coal Co., 1,800 shares Tennis Coal Co., 500 shares York Coal & Coke Co. Leased by Mineral Fuel Co. to Elk Horn Mining Corp. b Consists of 5,470 shares pref. and 3,624 com. stock.

DIVIDENDS

The following is a list of the more important dividends recently announced:

Consolidation Coal Co.—Regular quarterly dividend of 1½%, payable July 31 to holders of record July 24.

Delaware, Lackawanna & Western Coal.—Regular quarterly dividend of 2½% and an extra dividend of 50%, both payable July 15 to holders of record July 1.

American Coal—Dividend of 3%, payable Sept. 1 to holders of record Aug. 31.

John M. Taylor Coal Co.—Semiannual dividend of 3½% on the preferred stock, payable Aug. 20.

Elk Horn Fuel Co.—Dividend of 1¼% on the preferred, payable Aug. 2 to holders of record May 1.

Jefferson & Clearfield Coal and Iron Co.—Dividend of 1¼% on the preferred, payable Aug. 16 to holders of record Aug. 1.

Pacific Const Co.—Regular quarterly dividend of 1¼% on the first preferred and 1% on the second preferred, both payable Aug. 2 to holders of record July 25 to Aug. 2.

Coal Contracts Pending

COAL AGE PUBLICATIONS INC.

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 16.

+Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1047—Kansas City, Mo.—William Volker & Co. still continue to buy their coal requirements on this contract (p. 116), in the open market. Address Purchasing Agent, William Volker & Co., Main and Second St., Kansas City, Mo.

1056—Kansas City, Mo.—The Gillpatrick Laundry Co. has decided to continue buying their coal requirements on this contract (p. 116), in the open market for the time being, but are willing to consider propositions to contract at any time. Address Purchasing Agent, The Gillpatrick Laundry Co., Vine and 15th St., Kansas City, Mo.

1062—Kansas City, Mo.—The Faultless Starch Co. will still continue to make their fuel purchases in the open market (p. 116), but they are willing to consider a proposition to cover their requirements at any time. Address Pres. J. G. Beecham, Faultless Starch Co., 1025 E. Eighth St., Kansas City, Mo.

+1192—New Brunswick, N. J.—Bids have been received on this contract (p. 244), which provides for furnishing the City Pumping Station with approximately 900 tons of coal as follows: Daniel June No. 1 Logan \$4; New Brunswick Ice Co., Beaverdal \$4.30; C. W. Russell No. 1 Logan \$4.39. No notice of the award has yet been received. Address City Clerk E. J. McLaughlin, Dept. of Pub. Affairs, New Brunswick, N. J.

+1198—Columbus, Ohio—The Ohio Board of Administration advises that they are now only receiving bids on the Cleveland State Hospital, Columbus State Hospital, Dayton State Hospital, and Ohio Penitentiary on this contract (p. 244). Address T. E. Davey, Ohio Bd. of Adminisfration, Columbus, Ohio.

+1252—Minot, N. D.—The second call for bids on this contract (pp. 284, 410) was received until 2 p.m., Sept. 17. The contract provides for furnishing school buildings Nos. 1, 2, 3 and 4 of the Burlington School District with coal. Address Clk. W. E. Gross, Burlington School Dist. No. 7, Minot, N. D.

1260—Louisville, Ky.—The Watterson Hotel, which usually consumes 2500 tons of nut and slack coal per year advise that they are concluding arrangements to buy steam and will not make any contract this season. Address Mgr. Robert B. Jones, Watterson Hotel, Louisville, Ky.

1262—Des Moines, Iowa—The tonnage involved on this contract (p. 324), which provides for furnishing coal to some 60 schoolhouses of the Independent School District aggregates about 8000. Steam coal will be required mostly although some lump and range will also be bought. The contract is to include cost of delivery in the bins at the schoolhouses. Address Secy. A. L. Clinite, Bd. of Edu., Des Moines, Iowa.

1267—Wellsburg, W. Va.—This contract (p. 324), which provides for furnishing the local City Water-Works with coal during the ensuing year was bid on as follows: Wolf Estele & Ondo 5½c. per bu.; Elias K. Lazear 6c. per bu.; Washington Pike Coal Co., 6¼c. per bu. Address Secy. J. F. Thompson, City Water Bd., Wellsburg, W. Va.

+1285—Bay City, Mo.—New bids have been received on this contract (p. 324), which provides for furnishing the County Government with coal for the Court House during the ensuing year as follows: City Fuel & Supply Co., \$3.40; A. S. Williams & Co., \$3. Steam lump coal is required. Address County Clk. C. L. Fox, Bay City, Mo.

New Business

+1417—Reading, Mass.—The Municipal Light Department at this place usually contracts for their annual requirements of coal some time during the fall months. The current contract was filled on the basis of \$4.20 per ton for Pocahontas or New River coal, the gross requirements being approximately 400 tons. Address Mgr. A. G. Sias, Municipal Light Dept., 179 Main St., Reading, Mass.

+1418—Huron, S. D.—The Board of Commissioners at this place received bids until 1 p.m., Sept. 13, for furnishing approximately 400 tons of Youghiogheny lump coal, to be delivered at the city pumping plant as required at the rate of about 40 tons per month. Bids were also received on 12 tons of anthracite and 18 tons of Pocahontas lump coal to be delivered at the City Hall, Jail and Library. Address City Audr. S. S. Oviatt, Huron, S. D.

1419—Bellaire, Ohio—The Mead Township Board of Education received bids until Sept. 10, for furnishing approximately 1,900 bu. of three-quarter coal to be delivered to the various subdistricts as required prior to Oct. 1. Address Clk. Thomas C. Kirkland, Mead Township, Bd. of Edu., Belmont County, Bellaire, Ohio.

1420—New Haven, Conn.—The Connecticut Co.'s contract, involving approximately 22,000 tons of good grade low volatile, low ash, low sulphur bituminous coal, expired on the first of the current month. Shipments are made as required f.o.b. boats, to be placed by the company at New York loading ports. For data in regard to the old contract see Vol. 6, p. 735. Address Pur. Agt. J. H. Sanford, The Connecticut Co., New Haven, Conn.

+1421—Dowagiac, Mich.—The Water and Light Dept. at this place usually contracts some time during October for their annual requirements of coal involving approximately 1,000 tons. Island Creek nut, pea and slack coal is commonly used and the usual price is about \$3.10 per ton. Address Supt. W. E. Reynolds, Water and Light Dept., Dowagiac, Mich.

1422—Westwego, La.—The New Orleans Industrial Oil Co. are receiving bids on approximately 100 tons of steam coal for use during the ensuing year. Address Mgr. J. P. Eggert, New Orleans Industrial Oil Co., Westwego, La.

+1423—Topeka, Kan.—The Municipal Electric Department usually contracts in October for their annual requirements of coal involving approximately 400 tons. Southern Kansas coal is used and it is ordinarily bought at \$2.25 per ton for slack and \$2.50 for stove. The business is done on competitive bids. Address Supt. E. G. Stahl, Municipal Electric Light Dept., Topeka, Kan.

1424—Warren, Ohio—The Trumbull County Board of Commissioners will receive bids until Sept. 20, for furnishing about 500 tons of coal for the County Infirmary. Address Audr. W. R. Harrington, Trumbull County, Warren, Ohio.

1425—New Orleans, La.—The Albert Weiblen Marble & Granite Co. will soon contract for their annual requirement of coal involving approximately 2,000 tons. Address Pur. Agt. Albert Weiblen Marble & Granite Co., City Park Ave. and St. Louis St., New Orleans, La.

+1426—Rugby, N. D.—The Pierce County Commissioners will receive bids until 2 p.m., Oct. 5, for furnishing coal as may be required during the ensuing year. Address Audr. A. O. Spillum, Pierce County, Rugby, N. D.

1427—Zylonite, Mass.—The contract for the Berkshire St. Ry. Co., involving approximately 21,000 tons of a good grade, low volatile, low ash, low sulphur, bituminous coal expired on the first of the current month. Shipments are to be as required, and quotations should be made f.o.b. cars at mines for Tunnel Power plant at Zylonite, Mass., B. & A. R.R. Address Pur. Agt. J. H. Sanford, Berkshire Street Ry., New Haven, Conn.

+1428—Unionville, Mo.—The Municipal Light and Water Works at this place usually contract some time in October or November for their annual requirements of coal, involving about 200 tons of nut and pea per month. The business is done on a competitive basis and the approximate cost is about \$1.10 per ton. Address Supt. M. T. Lynn, Unionville, Mo.

1420—Massillon, Ohio.—The Board of Education of the city school district will receive bids until Sept. 29 for furnishing the various public schools with Goshen or Massillon mine-run lump and slack coal. Address Clk. William Fielberth, Bd. of Edu., Massillon, Ohio.

1430—Fargo, N. D.—Bids were received until Sept. 15 for furnishing approximately 1,500 tons of Youghiogheny screenings and 500 tons of Pocahontas mine-run, to be delivered at the Detention Hospital and Filtration Plant as required during the ensuing year. Address Audr. A. R. Watkins, Bd. of Com., Fargo, N. D.

1431—Braddock, Penn.—Bids were received until 7 p.m., Sept. 13, for furnishing the Rankin School Board with three-quarter and mine-run coal. Address Secy. H. W. Peters, Rankin School Bd., Rankin, Penn.

1432—Hammond, Ind.—The Northern Indiana Gas & Electric Co. usually contract for their annual requirements of coal some time during October. One and one-quarter inch Indiana screenings are used and approximately 35,000 tons are required. The coal is bought on competitive bids, the usual price being about \$1.38 per ton delivered. Address Purchasing Agent, Northern Indiana Gas & Electric Co., Hammond, Ind.

+1433—Peoria, Ill.—The City Government received bids until 5 p.m., Sept. 14, for furnishing the city with bituminous lump coal for one year beginning Oct. 1. The coal must be from Peoria County and 1½-in. lump size. A certified check for \$200 must be furnished with each bid. Address Clk. William E. Moran, Peoria, Ill.

+1434—Poplar, Mont.—Bids will be received by the Poplar Public Schools, District No. 9, until noon, Sept. 24, for furnishing approximately 75 tons of Hocking Valley coal to be delivered in the school bins as required during the ensuing year. Address Clk. H. C. Walker, School Dist. No. 9, Poplar, Mont.

1435—New Orleans, La.—The Canal Bank & Trust Co. will receive bids until Oct. 1, for furnishing coal required at their office buildings, involving approximately 150 tons of bituminous. Address Purchasing Agent, Canal Bank & Trust Co., Camp and Gravier Sts., New Orleans, La.

1436—Linton, N. D.—The Emmons County Board of Commissioners will receive bids until 4 p.m., Oct. 5, for furnishing and delivering 70 tons of lignite coal at the County Court House. Address Audr. John R. Snyder, Linton, N. D.

+1437—Osage City, Kan.—The City Government received sealed bids until 8 p.m., Sept. 15, for furnishing the coal required by the local Electric Light Plant, and for other city purposes during the period from Sept. 15, of the current year to Mar. 15 of next year. Osage City shaft coal is required. Address City Clk. C. E. Johnson, Osage City, Kan.

1438—New Orleans, La.—The Interstate Bank & Trust Co. will be in the market about Oct. 1 for their annual fuel requirements of their office building, involving about 200 tons of bituminous coal. Address Pur. Agt. Mr. Billingsley, Interstate Bank & Trust Co., New Orleans, La.

1439—Muscatine, Iowa.—The County Government received bids until 5 p.m., Sept. 14, for furnishing approximately 200 tons of soft lump coal for use on the Muscatine-Louisa Drainage District No. 13. Address Audr. H. C. Schoemaker, Muscatine County, Muscatine, Iowa.

1440—Minot, N. D.—The Lexington Hotel at this place will receive bids until 2 p.m., Sept. 18, for furnishing approximately 300 tons of screened lignite coal, quotations to be f.o.b. Minot. Address Olof O. Olson, Lexington Hotel, Minot, N. D.

1441—New Orleans, La.—The New Orleans Cold Storage & Warehouse Co. will contract about Oct. 1 for their annual requirements of coal, involving approximately 3,500 tons of bituminous. Address Purchasing Agent, New Orleans Cold Storage & Warehouse Co., Ginnie and Front St., New Orleans, La.

1442—Crookston, Minn.—The Polk County Board of Commissioners will receive bids until 2 p.m., Sept. 21, for furnishing approximately 160 tons of Greensbury mine-run coal to be delivered at the Court House as required during the coming fall and winter. Address Audr. H. J. Weite, Polk County, Crookston, Minn.

1443—Minot, N. D.—The Dakota Bakery Co. will receive bids until 2 p.m., Sept. 30, for furnishing one carload of lignite coal per month. Address Purchasing Agent, The Dakota Bakery Co., Minot, N. D.

1444—New Orleans, La.—The American Brewing Co. of this place is in the market for their annual supply of coal, involving approximately 10 tons per day. Address Ed. G. Schleider, American Brewing Co., New Orleans, La.

1445—Chariton, Iowa.—The County Government received bids until noon, Sept. 14, for furnishing coal required at the Court House, County Home, and for the paupers. The coal for the Court House will be delivered in the bin. Address Audr. Fred. N. Wilson, Chariton, Iowa.

+1446—Mauch Chunk, Penn.—The Borough School Board at this place will receive bids until 4 p.m., Sept. 24, for furnishing 60 tons of chestnut coal to be delivered at the Asa Packer Building, and 75 tons of pea coal to be delivered in the First Ward Building. Address Secy. C. S. Weiler, Borough School Bd., Mauch Chunk, Penn.

1447—New Orleans, La.—The Jacob Candy Co. will contract about Oct. 1 for their winter's supply of coal, involving approximately 400 tons of Pratt lump coal. Address Pres. Mose Jacobs, Jacobs Candy Co., Carondelet St., New Orleans, La.

+1448—Crosby, Minn.—The Independent School Dist. No. 51 will receive bids until 8 p.m., Sept. 18, for furnishing and delivering Youghiogheny screened lump coal, as may be required during the school year at Ironton, Thomas Jefferson and Franklin schools. Address Clk. J. E. McCoy, Independent School Dist. No. 51, Franklin School Bldg., Crosby, Minn.

+1449—Lisbon, N. D.—The Lisbon Special School Dist. No. 19 will receive bids until 1 p.m., Oct. 1, for furnishing approximately 125 tons of Hocking Valley, Zenith, Sunday Creek, Youghiogheny or Scott Smokeless Briquetts, to be delivered in the bins of the school buildings. Address Clk. W. S. Adams, Lisbon Special School Dist. No. 19, Lisbon, N. D.

+1450—Detroit, Mich.—The Wayne County's Board of Auditors will receive bids until 11 a.m., Sept. 18, for furnishing approximately 25 tons of anthracite chestnut, and 2,500 tons of bituminous three-quarter lump. Address Secy. William Gutman, Bd. of Audrs., Wayne County, Detroit, Mich.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+No. 960—Harriman, Tenn.—This contract (pp. 41, 411), which provides for furnishing the Harriman Water and Light Department with 2,160 tons of coal, has been awarded to the **Middle Creek Co.**, instead of Church & Co. as previously noted. Bids on this contract were: Goldfield Coal Co., 95c.; State Mine Coal Co., \$1.15; Middle Creek Co., \$1. All bids were on mine-run coal. Address R. C. Walzl, Harriman Water & Light Dept., Harriman, Tenn.

No. 970—Gretna, La.—This contract (p. 41), which provides for furnishing the American Cotton Oil Co., has been awarded to the **Warrior Coal Co.** of Birmingham, Ala., at between \$1.12 and \$1.18 per ton. The contract, which involves 20,000 to 25,000 tons, will be filled on Pratt mine-run coal. Address Mgr. John W. Todd, American Cotton Oil Co., Gretna, La.

No. 1018—Kansas City, Mo.—This contract (p. 77), which provides for furnishing the Kelly Milling Co. with about 20 tons of slack coal per day, has been awarded to the **Sheridan Coal Co.** at \$2.05 per ton. The Cherokee Fuel Co., Central Coal & Coke Co., and Interstate Coal Co. each bid \$2.05 per ton also, it being understood that the contract was awarded to the **Sheridan Coal Co.** on account of the regular grades. Address J. M. Kelley, Jr., Kelly Milling Co., Rochester and Park Ave., Kansas City, Mo.

+No. 1019—Allentown, Penn.—bids on this contract (pp. 77, 157), which provides for furnishing the North Whitehall Township school district with 100 tons of stove and chestnut coal, were all the same, \$6.25 per ton, so that the contract was divided equally between the three companies, who were the Balliet Bros. & Co.; R. W. Grammer, and Rockdale Coal Co. Address Secy. A. N. Kuhns, Orefield, Penn.

+No. 1035—Pueblo, Colo.—This contract (p. 115), which provides for furnishing the local schools with coal during the ensuing year, has been let in part, the requirements for District No. 20, including all the territory in the city south of the river, involving approximately 400 tons, having been awarded to the **Iron City Fuel Co.** and the **Forbush Fuel & Ice Co.** at \$2.10 per ton for Rugby slack, f.o.b. cars, Pueblo. About 2000 tons per annum are required in this district, but the remainder will not be contracted for, purchases to be made in the open market on the prospect of obtaining better prices. On the contract for District No. 1 covering all the cities north of the Arkansas River, and involving approximately 1,600 tons, there were four bidders but no award has yet been made. Address E. J. Scott, Pueblo, Colo.

No. 1125—Columbus, Ohio.—Director of Public Service G. A. Borden has awarded this contract (pp. 158,283), as follows: Elk Coal Co., Columbus, approximately 3,500 tons of West Virginia mine-run to the Scioto River Pumping Station at \$1.42 delivered on the switch, the Victoria Coal Co., Columbus, approximately 10,000 tons of Hocking nut, pea and slack for

the municipal light plant at \$1.19, also the 3,000 tons for the Garbage Reduction plant, Hocking nut, pea and slack at \$1.19; M. A. Suydam & Co., Columbus, was awarded the contract for about 500 tons for various other city departments, delivered, Hocking lump at \$2.17½. There was considerable controversy over these contracts and Director Borden has asked an opinion of the city solicitor if he could award the contract for Ohio-mined coal even at higher figures. The answer was that he was the judge as to the "lowest and best bids." Address Dir. of Pub. Safety B. L. Bargar, City Hall, Columbus, Ohio.

1132—Bloomington, Ill.—This contract (p. 198), which provides for furnishing the local Bd. of Education with approximately 1000 tons bituminous lump coal, has been awarded to the **McLean Coal Co.**, on 2nd or 3rd Vein at \$2.75 per ton. Address, Chairman R. E. Williams, Board of Education, 602 Peoples Bank Bldg., Bloomington, Ill.

+1146—Wichita, Kan.—This contract (p. 199), which provides for furnishing the local Board of Education with approximately 2500 tons of coal, has been awarded. The bidders on the contract were: The Central Coal Co., the Jackson-Walker Co., and the Good-Hillyard Coal Feed Co. Address Clk. J. L. Leland, Bd. of Edu., City Hall, Wichita, Kan.

+No. 1149—Broken Bow, Neb.—This contract (p. 199), which provides for furnishing Custer County with its coal requirements during the ensuing year, has been awarded to the **Dierks Lumber & Coal Co.**, at \$6 per ton delivered in bin at the county courthouse. Address Clk. R. E. Waters, Broken Bow, Nev.

+No. 1150—Muscatine, Iowa—This contract (p. 199), which provides for furnishing the county institutions with 400 tons of bituminous coal, has been awarded to the **Huttig Lumber & Coal Co.** Address County Audr. H. C. Shoemaker, Muscatine, Iowa.

+No. 1153—New Philadelphia, Ohio—This contract (p. 199), which provides for furnishing the Local Board of Education with coal as required during the ensuing year, has been awarded to **John Hale** at \$2 per ton delivered in the school buildings. The coal is to be clean and loaded on wagons with a fork at the mine. Other bids received on this contract were: Earnest Carson, 9c. per bu. (80 lb.); Whippoorwill Coal Co., \$2.20 per ton and \$2.15 per ton where delivery can be made by motor truck; John Marchesi, \$2.25 per ton; Brown Coal Co., \$2.20 per ton; New Castle Coal Co., \$2.25 per ton. Address Clk. A. A. Stermer, Bd. of Edu., New Philadelphia, Ohio.

1163—Carthage, Mo.—This contract (p. 199), which provides for furnishing the local Board of Education with approximately 250 tons of Nevius coal, has been awarded to the **I. C. Wheeler Building & Milling Co.** at \$3.15 per ton delivered in the bins. Address Chn. W. F. Maring, Supply Com., Bd. of Edu. Carthage, Mo.

+1164—Fargo, N. D.—This contract (p. 199), which provides for furnishing the local board of education with coal during the year ending June 1, 1916, has been awarded as follows: **Washburn Lignite Coal Co.**, 2000 tons of lignite at \$3.15 per ton, delivered; **O. M. Strate**, 200 tons of Pocahontas mine-run at \$5.35 per ton. The Dakota Lignite Coal Co. also bid on lignite coal and there were four additional bids on the Pocahontas. Address Secy. E. G. Guthrie, Bd. of Edu., High School Bldg., Fargo, N. D.

1167—Guthrie Center, Iowa—This contract (p. 199), which provides for furnishing the Guthrie County Courthouse with coal during the ensuing year, has been awarded to **Compton & Son** at 15c. per bu. delivered at the Court House. Address W. H. Neal, Bd. of Supervisors, Guthrie County, Guthrie Center, Iowa.

+1174—Canton, Ohio—This contract (pp. 243, 366), which provides for furnishing the local public schools with approximately 2800 tons of coal, has been awarded to the **Steiner Coal Co.** at \$2.24 per ton for Crescent No. 8 coal from Belmont County. This company has furnished the coal for the local schools for a number of years and although its bid was not the lowest, it was again accepted this year. Address Clk. W. C. Lane, Bd. of Edu., High School Bldg., Canton, Ohio.

+No. 1176—Topeka, Kan.—This contract (pp. 243, 366), which provides for furnishing the local Board of Education with its coal supply, has been awarded to the **Southwestern Fuel Co.** on the following basis: 200 tons of lump, \$3.60; 200 tons of slack, \$2.65; 2000 tons of nut, \$3.20. Address Clk. M. C. Holman, Bd. of Edu., Topeka, Kan.

1195—Green Bay, Wis.—This contract (p. 244), which provides for furnishing the Brown County Asylum with approximately 600 tons of pile-run bituminous coal, has been awarded to **F. Hurlbut Co.**, at \$3.25 per ton for Kentucky Elkhorn coal. Bids were received for the same grade of coal from other companies as follows: **H. Barkhausen Co.** \$3; **C. Keiss**

Co. \$3.41; **Haevers Co.** \$3.20. Address Joseph H. Servotte, Bd. of Trustees, Brown County Asylum, Green Bay, Wis.

No. 1199—Chattanooga, Tenn.—This contract (p. 244), which provides for furnishing the city government with approximately 1800 tons of coal for the fire halls, school buildings, and other city buildings, has been awarded to **Church & Co.** Address Comr. E. D. Herron, Dept. of Pub. Utilities, Grounds and Bldgs., Chattanooga, Tenn.

+No. 1205—Uhrichsville, Ohio—This contract (p. 244), which provides for furnishing the Board of Education with screened coal, has been awarded to **C. R. Shipton** at \$2 per ton. Address Clk. D. E. Rock, Uhrichsville Village School Dist., Uhrichsville, Ohio.

1206—Sawyer, N. D.—This contract (p. 244), which provides for furnishing and delivering for the county government at this place, approximately 100 tons of lignite, has been awarded to **Jay Sharar**, at \$2.89 per ton. Henry Greenwald bid \$3 per ton and Henry Buechler \$2.90, per ton. Address, Dist. Clk. E. D. Skinner, Sawyer, N. D.

+1207—Cloquet, Minn.—This contract (p. 244), which provides for furnishing the local Board of Education with approximately 500 tons of Pocahontas screened lump coal, has been awarded to **William Kelly**, at \$5.23 per ton. William Lane bid \$5.25 and J. E. Johnson \$5.50 per ton. Address Dist. Clk. L. F. Leach, Bd. of Edu., Cloquet, Minn.

+1209—Wahpeton, N. D.—This contract (p. 245), which provides for furnishing the Richland County commissioners with approximately 300 tons of Pocahontas mine-run coal, has been divided equally between **H. M. Christenson** and **J. E. Morris**, both of whom bid \$6.15 per ton delivered. J. B. Lotzer bid \$6.25 per ton. Address County Audr. F. A. Burton, Wahpeton, N. D.

1210—Buffalo, Minn.—This contract (p. 245), which provides for furnishing the county government with approximately 100 tons of Youghiogheny screened lump coal, 60 tons of which are to be delivered at the Court House and the balance f.o.b. side track at this place, has been awarded to **Wm. Karb**. Address County Auditor John A. Berg, Buffalo, Minn.

+No. 1214—Dayton, Iowa—This contract (p. 245), which provides for furnishing the Independent School District with coal, has been awarded to **William & Shastrom** at \$6.05 per ton for the best Kentucky coal, delivered at the school houses. Address Secy. O. S. Larson, Independent Dist. of Dayton, Iowa.

1218—Mott, N. D.—This contract (p. 245), which provides for furnishing the Mott School District with approximately 250 tons of lignite coal has been awarded to **N. A. Mosher** at \$2.50 per ton. Address Clk. R. E. Trousdale, Mott School Dist. Mott, N. D.

+1222—Regent, N. D.—This contract (p. 245), which provides for furnishing the Regent School District with a good grade of lignite coal has been awarded to **N. R. St. Marie** at \$2.20 per ton. Address Clk. F. L. Schnebly, Regent School Dis. No. 14, Regent, N. D.

+No. 1223—Missoula, Mont.—This contract (p. 245), which provides for furnishing the local school board with approximately 500 tons of coal, has been awarded to the **Perry Coal Co.**, at \$5.55 per ton for special Round-Up lump coal delivered at the school buildings. Address Clk. M. R. Hardenburgh, School Dist. No. 1, Missoula, Mont.

1228—Johnstown, Penn.—This contract (p. 245), which provides for furnishing the Board of Education with coal during the ensuing year, has been awarded as follows: **Charles P. Bender**, First District, \$1.43 per ton; **Prosser-Thomas Coal Co.**, Third District, \$1.50 per ton; **Charles P. Bender**, Second District, \$1.40 per ton. There were nine bidders on the contract. Address Secy. Charles H. Meyer, Bd. of Edu., 601 Swank Bldg., Johnstown, Penn.

+1231—Wilkes-Barre, Penn.—This contract (p. 245), which provides for furnishing coal for the 23 school buildings of the local school district, during the ensuing year, has been awarded to **W. G. Downs** as follows: Schools Nos. 1, 2, 3, 4 and 5, \$4.20 per ton; No. 6, \$3.20; No. 7, \$2.40; No. 2 (buckwheat), \$1.63; rice, \$1.12. Address Secy. W. H. Morris, 58 Lee Park Ave., Hanover Township, Penn.

+1233—Dickinson, N. D.—This contract (p. 283), which provides for furnishing the local School Board with approximately 500 tons of mine-run coal, has been let to the **Oakota Lignite Mines Co.** at \$2.18 per ton for lignite delivered to the school buildings. Address Clk. L. R. Baird, Bd. of Edu., Dickinson, N. D.

+No. 1244—Delaware, Ohio—This contract (p. 284), which provides for furnishing the County Commissioner with 240 tons of 3-in. coal and 40 tons of washed nut, f.o.b. cars, Leonardsburg, Ohio, has been awarded to **S. C. Kissner & Sons**. Address County Audr. W. D. Aldrich, Leonardsburg, Ohio.

No. 1245—Missoula, Mont.—This contract (p. 284), which provides for furnishing between 250 and 300 tons of coal for the high school building, has been awarded to the **Perry Coal Co.**, on Bear Creek lump, at \$6.10 per ton. Address Secy. A. J. Violette, Bd. of Trustees, County High School, Missoula, Mont.

+1246—Fairmont, N. D.—This contract (p. 283), which provides for furnishing the local School Board with two car-loads of stove coal, has been awarded to the **Sulzer Lime Co.** at \$9.45 per ton delivered in bins during August and \$9.50 per ton in January. Turback Bros. bid \$9.70 and Elliott Elevator Co., \$9.50 on track. Address Clk. F. E. Crafts, Bd. of Edu., Fairmont, N. D.

+1248—Lake Park, Minn.—This contract (p. 284), which provides for furnishing the local Board of Education with coal, has been awarded to **E. T. Viger & Son**, at \$5.19 per ton for Hocking lump coal. Address Secy. Kristofer Delager, Bd. of Edu., Lake Park, Minn.

1250—Falls City, Neb.—This contract (p. 284), which provides for furnishing the local Board of Education with approximately 500 tons of coal, has been awarded to **I. C. Maust** at: Weir City nut, \$4; Breese 6-in. lump, \$4.25. Quotations include cost of delivery in bins, some of the buildings requiring a haul of a mile and a half. Address Secy. F. Brecht, Bd. of Edu., Falls City, Neb.

+No. 1253—Stanley, N. D.—This contract (p. 323), which provides for furnishing the Montrail County Court House with coal as may be required during the ensuing year, has been awarded to the **Nelson Grain Co.**, at \$3.10 per ton for lignite coal delivered in the bin. Address County Audr. H. P. Duggan, Court House, Stanley, N. D.

Contract Notes

Albert Lea, Minn.—The contract for furnishing the County Poor House has been awarded to the **Speltz Grain & Coal Co.**

Dickinson, N. D.—The contract for furnishing the Dickinson schools with 500 tons of coal was let to the **Dakota Lignite Co.**, at \$2.18 per ton. Lignite mine-run was specified.

New Orleans, La.—William Garrigue Co., Gretna, La., Swift & Co., Harvey, La., and the Westwego Ice & Bottling Works, Westwego, La., recently started using oil instead of coal.

Argenta, Ark.—The contract for furnishing 100 tons of the best domestic lump for the city schools has been awarded to **J. Y. Wortham** at \$4.25 per ton delivered in the bins. Other bids ran as high as \$4.40.

Crookston, Minn.—**Sargent & Hanna**, of Grand Forks, have been awarded the contract for furnishing the public school buildings of the city with coal for the fall and winter term, their bid being \$4.54 per ton.

New Orleans, La.—The New Orleans Industrial Alcohol Co. has opened a new factory at Westwego, La., across the river from New Orleans, and will be in the market for coal very shortly. Address, New Orleans Industrial Alcohol Co., Westwego, La.

Lewiston, Idaho—The Idaho Ice & Cold Storage Co., who are mine agents for several Wyoming and Utah coals announce an advance of 25c. per ton, which is an unusual condition at this time of year. No reason for the advance has been given.

Springfield, Minn.—The contract for furnishing the local Board of Education with 125 tons of Hocking Valley screened lump coal has been awarded to **Charles Davin** at \$5.50 per ton delivered in the bin. Address Clk. John Schmelz, Bd. of Edu., Springfield, Minn.

Louisville, Ky.—Strater Bros. Tobacco Co., at this place, consumes about 200 tons of Kentucky pea and slack coal per annum. Deliveries are made by wagon at the rate of approximately 6½ tons a day. Address Purchasing Agent, Strater Bros. Tobacco Co., Louisville, Ky.

Hillsboro, N. D.—The prices at which the contract for furnishing the local power house with coal during the ensuing year (p. 246) was awarded were: Youghiogheny pea, \$3.10; Elkhorn screenings, \$2.65. As previously noted, the contract went to the **Hillsboro Lumber Co.** Address City Audr. N. G. Nyhus, Hillsboro, N. D.

Philadelphia, Penn.—The Bernstein Mfg. Co., at this place, consumes approximately 1500 tons of bituminous coal. Deliveries are made by railroad at the rate of 125 tons per month. The company has storage capacity for 75 tons. Address, Pur. Agt. H. W. Schob, Bernstein Mfg. Co., Third and Allegheny Ave., Philadelphia, Penn.

New Orleans, La.—The contract for supplying the Tulane University and Newcomb College with coal during the en-

suing year has been awarded to the **R. P. Hyams Coal Co.** The tonnages involved are 590 tons of steam coal, 175 tons anthracite, 1,000 barrels gashouse coke. Address Pur. Agt. F. D. Layman, Tulane Campus, New Orleans.

Topeka, Kan.—The State Board of Control has awarded a contract for furnishing the State Charitable Institutions with approximately 60,000 tons of coal to the **Topeka Cold Storage Ice and Fuel Co.**, at \$1.74 per ton for domestic coal and \$1.34 per ton for slack. It is provided that all the coal must be deep-mined. The price is slightly under the figures for last year.

New York—The Commissioner of Docks and Ferries opened bids on Sept. 7 for furnishing and delivering 15,000 gross tons of No. 1 buckwheat and 6,000 tons of semibituminous coal at such times as may be directed. Meeker & Co. and Pattison & Bowns bid \$2.89 per ton on both the buckwheat and bituminous, and Charles D. Norton & Co. bid \$2.68½ per ton on the same. For previous purchases of this department during the current year, see contracts Nos. 48, 373, 935, 1068, and contract note, Vol. 8, p. 286. Address Comr. R. A. C. Smith, Dept. of Docks and Ferries, Pier A, foot of Battery Place, New York City.

Railroad Storage—The various railroads are continuing to pile up coal in anticipation of possible labor disturbances. The Pennsylvania R.R. in addition to storing coal at East and South Altoona is also putting in stock a large quantity in the Enola freight yards near Harrisburg, and is arranging for the storage of anthracite at Lock Haven and Sunbury. The Lehigh Valley is filling its plant at Huddsonale, and is also arranging to fill the old Black Creek Junction plant. In addition to the large stocks of anthracite which they always carry, the Reading is storing bituminous coal in the vicinity of Pottsville and at other points along the line.

Columbus, Ohio—A strong protest has arisen among the people of the state over the award of the contract for 15,000 tons of coal for the Ohio State University for coal to be mined outside of the state (p. 286). The contract was awarded to the Lorain Coal & Dock Co., of Columbus, for Logan County (W. Va.) coal. Governor Willis, who has been taking a leading part in the "use Ohio coal" campaign, is very much worked up over the award and he is trying to get the successful bidder to agree to secure a portion of the tonnage from Ohio. The trustees of the Ohio State University claim that the B.t.u. test showed the samples of Logan County coal to be the best.

Foreign Notes

St. Michaels, Azores—Coal is selling as high as \$12.90 a ton at this place.

Azores—Another order for 3,000 tons of American coal has been placed by local dealers for delivery in schooners. Several schooners have been employed in the trade in recent months. The quickest voyage was 25 days. Freights are \$6 to \$7.50 per ton.

Russia—An American consular officer in Russia transmits the name and address of a railroad official who desires to receive names and addresses of American producers and exporters of coal who are in a position to ship coal to Russian Black Sea ports at the conclusion of the war.

Brazil—A firm of commission agents in Brazil informs an American consular officer that it would be pleased to represent American manufacturers and exporters. One member of the firm has had considerable experience in the sale of coal and desires to make a specialty of this. Other lines are not specified. Correspondence may be in English.

Chile (July 16)—Scarcely any business has been done in coal during the past fortnight, and the few transactions effected were: Part of a sailor cargo of Seaham, May sailing, was resold at \$9.12 for Antofagasta, and a small lot, same class, July sailing, at \$9.73 for Iquique. A steamer cargo of Pocahontas, August sailing, was placed at \$9.73. We quote Australian at \$9.73 to \$10.95, according to class, port and sailing.

London, England—Philadelphia export shippers of bituminous-coal have been surprised to receive inquiries for shipments to Liverpool, England. It has been known for some time after Aug. 13 the British Government would prohibit the export of coal from the British Isles and it was presumed that they would then be able to take care of all demands for domestic consumption. The shortage is probably due to the fact of so many of the English and Welsh miners have enlisted, and an increased quantity is necessary for the warships and munition plants.